NETWORK WORLD

The Newsweekly of User Networking Strategies

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AT&T to up PRI access, lower costs

By Bob Wallace
Senior Editor

SCOTTSDALE, Ariz. — Bowing to pressure from its early Integrated Services Digital Network customers, AT&T last week proposed major changes in the way it markets ISDN Primary Rate Interface service and its two features.

AT&T said it will increase the number of ISDN Primary Rate Interface network entry points scheduled to be on-line by 1990 from 110 to 290, lop a third off the price for telephone numbers delivered with its automatic number identification (ANI) feature and offer the previously optional Call-by-Call Service Selection feature free with its Primary Rate Interface service.

AT&T said it plans to offer ANI with its Software-Defined Network (SDN), Megacom 800 and MultiQuest interactive 900 service, as well as with special high-volume versions of Megacom 800 and MultiQuest.

The company detailed the changes for current ISDN users at a meeting here last week and said the tariff revisions it filed with the Federal Communications Commission are expected to take effect Jan. 1.

Analysts hailed AT&T's plans to more than double the number

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PHOTO ©1989 WAYNE CODY/GAMMA LIAISON

Ron Simons, a product manager in Microsoft's Network Business Unit, extolls the virtues of LAN Manager at Comdex/Fall '89.

Vendors wage PC bus war on LAN superserver front

Rivals debate merits of EISA, Micro Channel but agree that either will outperform minicomputers.

By Susan Breidenbach
West Coast Bureau Chief

LAS VEGAS — The "Battle of the Buses" heated up last week at Comdex/Fall '89 when IBM, reacting to the recent introduction of superservers based on the Extended Industry Standard Architecture (EISA), began to position its Micro Channel Architecture (MCA) as a superserver platform.

The EISA crusade at Comdex was lead by Compaq Computer Corp., which was showing off its recently announced SystemPro, a server that can be configured with multiple processors and support high-performance disk-array mass storage.

IBM countered by loading up an 80386-based Personal System/2 Model 80 configured with a second microprocessor (an 80486) and dual Small Computer System Interface (SCSI) controllers driving a total of 14 12-msec, 320M-byte hard disks. IBM's ad hoc superserver was shown running circles around a more traditionally configured Model 80 server.

One of the liveliest and most popular conference sessions at Comdex pitted IBM's Robert Carberry against Compaq's Gary Sti-

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IBM, Microsoft plot cohesive LAN plan

Vendors pledge to meld LAN products to create consistent systems software strategy for users.

By Susan Breidenbach
West Coast Bureau Chief

LAS VEGAS — IBM and Microsoft Corp. last week put to rest the debate concerning the differences between their respective LAN Server and LAN Manager network operating systems by agreeing to merge the two products.

The pledge was part of a broadened joint development agreement revealed at Comdex/Fall '89 here last Monday calling for the two companies to adopt a consistent systems software strategy that will help advance OS/2 as the personal computer server and client operating system environment of the 1990s.

By promising to make LAN Manager and LAN Server fully compatible, IBM and Microsoft hope to clear up confusion in the user community about the interoperability of the products. They also want to spur developer interest by providing a unified platform for network applications.

"The big change is that they are making one LAN Manager," said Mike Howard, a vice-president at Infonetics, Inc., a market research firm in Santa Clara, Calif. "Instead of having LAN Manager, LAN Server, 3+Open and so on, users and developers will get the advantage of one standard system."

While the current release of LAN Server is based on LAN Manager, the two products each have unique elements.

Under the expanded partnership, IBM has agreed to make the proprietary part of OS/2 Extend-

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MFS' Anthony Pompliano

MFS contests telcos' lock on local loop

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — Metropolitan Fiber Systems, Inc. (MFS), an alternative provider of local private lines, last week filed two legal petitions here in an attempt to end the regional Bell holding companies' virtual monopoly over local switched services.

The Oakbrook Terrace, Ill., carrier asked the Federal Communications Commission and the Department of Justice to open the local loop to competition for switched services. Most states currently permit alternative carriers to compete only for private-line services.

Should MFS prove successful, customers will be the big winners, according to company President Anthony Pompliano. He said the RBHCs have become complacent and that competition will spur

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NETLINE

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IBM'S NETCENTER to ship in late December with key non-SNA control feature. Page 2.

LAN MART MERGERS begin to yield products. Page 2.

SIX MORE VENDORS hop on DEC's EMA bandwagon as vendor unveils product. Page 2.

AT&T RAISES EYEBROWS with a Tariff 16 deal for a single 64K bit/sec line. Page 4.

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IBM AND APPLE microcomputers are finally talking to each other. Page 47.

NEWSPAPER

FEATURE

RPC tools pave way for cooperative processing

By James Kobielus
Special to Network World

To many users, cooperative processing is just an empty buzzword. To make it a reality, software developers need tools that enable them to build distributed network applications as easily as they write programs for single computers.

Help is on the way in the form of remote procedure call (RPC) application development products. Still unfamiliar to many communications professionals, RPC tools automate the process of tailoring applications to networks.

Most RPC products are essentially computer-aided software engineering (CASE) tools geared to network environments. RPC technology was initially developed in the 1970s at academic and commercial research centers such as the Massachusetts Institute of Technology and Xerox Corp.'s Palo Alto Research Center.

To date, commercial software developers have used it

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IBM set to ship NetCenter graphic NetView interface

Product includes component that lets it display, control non-Systems Network Architecture devices.

By Paul Desmond
Senior Writer

WHITE PLAINS, N.Y. — IBM last week said it will ship its NetCenter graphic NetView interface late next month and will include a feature that lets users display and control non-SNA devices.

NetCenter is scheduled to ship Dec. 29, complete with the Service Point Interface (SPI) software that US West Network Systems, Inc. (NSI) codeveloped with Union Pacific Railroad Co. ("NetView user ties non-IBM devices into IBM NetCenter," *NW,* Nov. 6). IBM announced in August it had acquired NetCenter from NSI but did not disclose the fate — or even the existence — of the SPI feature. SPI is the component that makes it possible for NetCenter to display alarms and alerts from non-Systems Network Architecture devices.

Union Pacific is currently the only user of that feature.

Still unclear, however, is what role NetCenter will play in IBM's long-term network management strategy. At a recent consultants

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LAN market merger mania results in pluses for users

First fruits of joint labors now hitting the street.

By Bob Brown
Senior Editor

Acquisitions in the local-area network market during the past few years are finally beginning to pay dividends, although some of the deals have stunted the once-valuable entrepreneurial spirit of the companies acquired.

The rash of LAN company acquisitions can be attributed mainly to system vendors looking to broaden their network capabilities and LAN vendors hoping to corner niche markets.

Independent LAN vendors will find it increasingly difficult to go it alone once the initial period of growth in their niche starts to subside, industry watchers said.

But there is a silver lining in the merger and acquisition cloud: These market moves generally benefit customers in the long run by enabling small companies to keep operating.

"The worst thing that can happen to a network manager is to have a vendor go out of business," said Louis Giglio, an analyst at Bear, Stearns & Co., Inc., a New York-based brokerage firm.

It is difficult, however, to compare the relative merits of specific deals because some major LAN industry acquisitions took place more than two years ago while others are less than a year old.

Novell, Inc.'s acquisition of Excelan, Inc. in June, for example, cannot be expected to pay off right away. 3Com Corp.'s acquisition of Bridge Communications, Inc. more than two years ago, on the other hand, should be spawn-

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DEC takes wraps off first EMA wares, adds backers

By Jim Brown
Senior Editor

BOSTON — Digital Equipment Corp. last week fleshed out its one-year-old Enterprise Management Architecture (EMA) with a series of announcements that included the company's first EMA product, a network management workstation.

DEC also promised that the previously announced core software component of EMA, the DEC Management Control Center (DECmcc) Director, would be available by the end of 1990. The DECmcc Director will enable the new workstation to control a range of multivendor devices.

In an effort to encourage the adoption of EMA as a de facto standard for integrated network management, the company also released technical specifications that will enable vendors and users to build EMA-based applications and announced that six more companies joined its EMA Strategic Vendor Program.

The six companies — including local-area network maker 3Com Corp. and T-1 multiplexer vendor Newbridge Networks, Inc. — and the seven existing EMA partners will build software linking their proprietary network equipment and management systems to EMA.

With the announcements, DEC makes good on its promise to deliver an EMA progress report by

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Briefs

This network takes the cake. Sweet Art, Inc. of Kansas City, Mo., is designing a network that will let bakeries transmit customized cake designs to participating bakers nationwide. Scheduled to go on-line next summer, the network will link about 70 bakeries via dial-up lines. Each participating baker will use a Sweet Art computerized cake decorating machine capable of receiving transmitted images or photographs and airbrushing the design onto a cake's icing. The digitized images are transmitted to the baker nearest the cake recipient.

Colorado Springs signs up for ISDN. The city of Colorado Springs last week signed a 43-month contract with US West Communications, Inc. for 200 Integrated Services Digital Network Basic Rate Interface lines, making it the first municipal government in the regional Bell holding company's 14-state region to use ISDN. Under the agreement, the city will be able to expand its ISDN use to link 141 city government offices serving 3,400 employees. Colorado Springs will use ISDN primarily to replace private lines and link local-area networks. The ISDN Basic Rate Interface lines will be provided by an AT&T Network Systems Group 5ESS digital central office switch in a US West central office.

Automaker orders autodialers. Ford Motor Credit Co. of Dearborn, Mich., last week placed initial orders for computerized autodialers with Davox Corp. as part of a plan to buy roughly $12 million of the systems over the next year.

Davox, a Billerica, Mass.-based vendor of computer-aided communications systems, said the Ford Motor Credit agreement is the company's single largest order. Ford Motor Credit will use the system to increase the production of customer service agents in 52 locations nationwide.

Taking stock. The Securities and Exchange Commission last week issued a statement encouraging stock exchanges to assess periodically the ability of their automated trading networks to withstand high trading volume or disasters. Among the recommendations is that exchanges should have an independent consultant review their automated trading systems, which consist of networked computers. Compliance with the proposal is voluntary.

Carriers tap MCI for int'l service. The International Carrier Group (ICG), a newly formed consortium of U.S.-based long-distance service providers, last week selected MCI Communications Corp. to carry the majority of its international voice traffic. The arrangement will enable the carriers to offer international voice services to their customers for the first time. The consortium includes Allnet Communications, Inc., Cable & Wireless Communications, Inc., Metromedia Long Distance/ITT and Telecom*USA, Inc. The three-year contract, effective immediately, is expected to generate $150 million for MCI over the life of the agreement. ICG traffic will be routed through each member's U.S. network to MCI gateway sites. MCI will carry the group's international switched voice traffic over satellite or undersea fiber cables.

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Telecommunications

Comments filed by long-distance carriers indicate that a rancorous battle is brewing over an FCC examination that could determine if AT&T will continue to be defined as a dominant carrier. **Page 17**

Data Communications

Digital Equipment Corp. last week said it will miss a promised deadline next month for publishing its DECprint architecture, a strategy to define how disparate systems on a DECnet or TCP/IP net can share network-attached printers. **Page 23**

Local Networking

Although Novell's NetWare is firmly entrenched as the No. 1 local-area network operating system, its continuing success is by no means assured, according to market research analysts. **Page 27**

Management Strategies

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Racal InterLan introduced a network management product that can be used to centrally monitor, configure and manage up to 50 remote Ethernet LANs linked by Racal InterLan bridges. **Page 31**

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Network World
Box 9171, 375 Cochituate Road
Framingham, Mass. 01701-9171
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AT&T files Tariff 16 plan for single int'l data line

Offering for AAFES links Dallas, West Germany.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — AT&T widened the scope of its custom net deals for government users and raised some eyebrows last week when it filed its first international calling plan under Tariff 16, a tariff for a single data line.

The offering, dubbed the Overseas Cable Digital Service, is for the U.S. Army-Air Force Exchange Service (AAFES), which operates all Air Force and Army military post exchanges. The tariff is for a 64K bit/sec private line between an AT&T central office in Dallas and a central office in Munich, West Germany.

According to Jim Spires, chief of data communications for AAFES, the link will supplement an existing 64K bit/sec line provided by Contel ASC.

If the proposed tariff is approved by the Federal Communications Commission, AT&T will begin providing service on Nov. 22. The interoffice link will cost the AAFES $3,315 per month; local dedicated access lines will be purchased either from AT&T at regular tariffed rates or from other carriers.

In the contract, AT&T guaranteed it would provide credits for any interruption of more than 30 minutes. Credits range from one-tenth of a day, for outages between 30 minutes and three hours, up to one day, for outages between 15 and 24 hours.

This is the seventh network deal AT&T has filed under Tariff 16 in less than a year, but it is the first for a single line.

One observer, who asked not to be named, questioned AT&T's motives for filing a tariff for a single line. AT&T is no longer pretending to justify its network deals with special service packages or volume discounts, he said. This is clearly an existing tariffed service being offered to a single customer under special terms and conditions, he said.

Jeff Held, a partner with Network Strategies, a consulting practice of Ernst and Young in Fairfax, Va., said a tariffed 64K bit/sec circuit between New York and West Germany would cost nearly $6,000 per month.

Held said he thinks AT&T uses Tariff 16 to do end runs around the regulatory pricing process. "AT&T is trying to see how far it can go with Tariff 16," he said.

Daniel Briere, president of TeleChoice, Inc., a research firm based in Manchester, Conn., said that it's unusual to have a tariff for a single data line, but he wasn't surprised that AT&T would resort to that. AT&T is aggressively targeting government users, he said, and this filing just shows how far AT&T will go to win a competitive bid.

EPA tests videoconferencing on gov't FTS 2000 network

By Gail Runnoe
Washington Correspondent

WASHINGTON, D.C. — The Environmental Protection Agency (EPA) will be the first government agency to use videoconferencing services on the new Federal Telecommunications System (FTS) 2000 network, AT&T said last week.

In February, the EPA will embark on a four-month pilot program in which it will test videoconferencing to link sites here and in Research Triangle Park and Durham, N.C.

The agency will use the system, which employs video compression technology, to conduct interactive training sessions, technical briefings, and staff and administrative meetings, said Bob Denny, a computer specialist with the EPA's Research Triangle Park office.

"Anyone who needs to talk to someone and share information in another location will be able to use the system," Denny said. Users will be asked to evaluate their conferences in terms of how helpful they were in increasing productivity and replacing a face-to-face meeting.

If the pilot proves successful, the EPA will consider extending videoconferencing to 15 to 20 of its regional offices and laboratories.

The cost of the pilot test will be about $150,000, Denny said. The EPA will spend about $50,000 on conference room equipment such as cameras and monitors, $26,000 on coder/decoder rentals and $75,000 on transmission service, assuming an average total system usage of four hours per day among the three sites.

(Government agencies on the FTS 2000 network are billed according to usage of network services.)

Denny could not estimate how much money might be saved in decreased travel expenses, but he said that was one question the pilot program should answer.

EPA employees will need to notify AT&T at its FTS 2000 control center at least an hour before a conference is held so the carrier can reserve the necessary bandwidth to carry the video signals. AT&T will enter the conference date, time and locations into an automated system that sets up the conference at the appointed time.

The EPA's videoconferencing system will require 384K bit/sec of bandwidth for transmission, AT&T said, which is almost half of the 768K to 1.544M bit/sec traditionally used for video.

Although AT&T also offers full-motion wideband video transmission services over its FTS 2000 network, Denny said the EPA chose to go with compressed video because it is less costly and provides adequate picture quality for the agency's needs.

AT&T said the FTS 2000 network can handle up to 85 simultaneous, compressed videoconferences during any one-hour period, connecting a maximum of 255 locations.

AST Research EISA-based PCs positioned as servers

By Tom Smith
New Products Editor

LAS VEGAS — AST Research, Inc. last week introduced at Comdex/Fall '89 here two Intel Corp. 80486-based personal computers that support the new Extended Industry Standard Architecture (EISA) and can be used as local-area network servers.

The company also unveiled an 80486-based microcomputer supporting the Industry Standard Architecture (ISA).

The three new products are the Premium 486/25TE EISA tower, the Premium 486/25E EISA desktop model and the Premium 486/25T ISA tower.

The company is targeting the EISA tower and desktop models at file server and multiuser environments, according to Eric Leppanen, product line manager for AST Research.

"EISA right now benefits primarily the high-end users," Leppanen said, because of its 32-bit I/O path. The company's EISA offerings use bus mastering, the technique of giving the board exclusive control of the personal computer bus for uninterrupted data transfer to the host's CPU.

Because of the higher throughput it offers, "EISA will be beneficial where the [IBM Personal Computer] AT bus may be

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Nynex strike nears final settlement

By Gail Runnoe
Washington Correspondent

NEW YORK — Nynex Corp. and negotiators for two striking unions last week scurried to piece together a tentative agreement for a three-year contract that could send striking workers back to their jobs today.

Industry observers noted, however, that even if the walkout is settled, the carrier will still need several months to process backlogged orders.

The two sides were close to hammering out a settlement on the major issues between Nynex and its 60,000 members of the Communications Workers of America (CWA) and International Brotherhood of Electrical Workers (IBEW) but were still trying to reach an accord on other issues at press time.

Health care costs — the most contentious issue on the bargaining table — seemed near resolution as mediators struck a compromise between Nynex and union members.

According to Nynex, the company agreed to shoulder all employee health insurance costs in exchange for a revised wage offer that eliminated a lump sum contract bonus and an employee profit sharing plan that were part of an earlier settlement proposal.

"While employees will not make [insurance] premium payments from their paychecks, they will make contributions through a revised compensation package," said William Ferguson, chairman of Nynex. "This approach offers a reasonable way for the company and its employees to share health care costs."

A spokeswoman for the CWA, however, saw the resolution of the health care issue as a victory for the unions. "We were able to maintain what we went on strike for," she said. No direct payment of health care costs will come from union members. Instead, insurance premiums will be paid from money Nynex had earmarked as part of a recent wage proposal.

The proposed contract also called for wage increases of 3% in the contract's first year and 1.5% wage increases, plus cost of living adjustments, in the second and third year.

At press time last week, local issues such as retiree health care, overtime, work schedules and work facilities remained unresolved. Nynex and union officials agreed that if those issues could be worked out by the weekend, workers would likely return to their jobs today and vote on the new contract at a later date.

But even if the unions do go back to work today, installation delays could continue to affect the business community for another five to six months, according to Ron Brown, an independent telecommunications consultant based in Melrose, Mass.

Brown also said the proposed settlement will have a strong financial impact on Nynex that will reverberate within the company for years.

Nynex "gave the unions its main bargaining point, and they may be stuck with that for a long time," Brown said. "Five years from now, [Nynex] will look at this settlement as an albatross."

Nynex, however, contends that it did not give in on the health care issue but merely shifted funds from other parts of the compensation package. Brown called this approach "penny-wise and pound-foolish. I think Nynex has locked itself into something it's not going to be able to get out of for quite a while," he said.

Over the next five years, Brown said the settlement will hinder the company's ability to effectively compete with alternative access providers, which have much leaner organizations.

As users are perceiving the service quality of alternative carriers to be "more than adequate, it's going to come down to a price war," he said.

Some observers have suggested that an employee profit sharing plan would have been a good mechanism for bringing union goals more in line with those of management and should have been incorporated in the deal.

Steve Kropper, a telecommunications analyst at International Data Corp. in Framingham, Mass., agreed that incorporation of a profit sharing plan for union members would have been "prudent." But Nynex probably did not press for it because the company does not see the threat from alternative access providers as imminent, he said.

"Alternative access carriers, such as Metropolitan Fiber Systems [Inc.] and Teleport [Communications Group], are finally making a difference," Kropper said, and the Bell operating companies will have to downsize to remain competitive.

Users breathed a sigh of relief last week as signs began to surface that the Nynex strike may be drawing to a close. "We'd be happy to see the workers go back to their jobs," said William Cunnane, assistant commissioner for the office of net services at the General Services Administration.

At the beginning of the strike, there had been some concern that cutovers of government agencies to the Federal Telecommunications System (FTS) 2000 network could be delayed.

Although Nynex assured the GSA that FTS 2000 would not be affected by the strike, Cunnane said that "as the net grew, our needs would grow," and Nynex might not have been able to meet unexpected GSA demands with a skeletal work force.

SOME FRANC ADVICE ON TRANSATLANTIC LEASED LINES

Monthly Cost for 64 Kbps Leased Lines and Networks

Satellite Service	Swiss PTT	British Telecom	Belgium RTT	Dutch PTT	German Bundespost	Mercury U.K.	France Telecom
U.S. to Europe and Intra-European Network	46.394	45.305	44.370	43.695	42.029	41.492	**40.198**
Intra-European Network	37.472	37.016	35.540	35.006	33.112	33.627	**32.288**
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Telecom pack for IBM PS/2s gets net upgrade

By Tom Smith
New Products Editor

LAS VEGAS — Hilgraeve, Inc. last week unveiled a major upgrade to its HyperAccess software that enables OS/2-based personal computers to transmit data over public and private nets.

The latest release, HyperAccess/5, performs personal computer-to-personal computer communications via local RS-232 connections or over wide-area links, such as asynchronous transmissions established with dial-up modems. The software previously ran only on DOS-based personal computers.

HyperAccess/5, which was announced here at Comdex/Fall '89, features proprietary data compression that cuts file-transfer times by up to 80%, according to the company. It also boasts artificial intelligence-like capabilities that enable users to automate frequently performed tasks.

The software runs on an IBM Personal Computer XT, AT, Personal System/2 and compatibles. DOS support is still offered in HyperAccess/5.

All capabilities are supported on DOS and OS/2 microcomputers, with the only difference being that HyperAccess/5 can run several routines unattended in background mode, whereas with DOS, only a single task runs in the foreground.

HyperAccess/5 was demonstrated in the IBM-Microsoft Corp. OS/2 applications booth.

At Comdex, Matthew Gray, the company's president, said the announcement that IBM and Microsoft will jointly commit the bulk of their development efforts to OS/2 and its Presentation Manager graphical user interface demonstrated the need for OS/2 communications packages such as HyperAccess/5.

"The statements reaffirmed that OS/2 is the ultimate place to be and that [Microsoft] Windows is primarily an optional transition to OS/2 from DOS," he said, explaining that the announcement should allay concerns about the future of OS/2.

High-speed file transfer

Hilgraeve utilizes a proprietary file-transfer protocol and data compression algorithm that gives it very high file-transfer rates, Gray said. The software can support modem transfer rates as high as 115.2K bit/sec, he claimed. Previously, the software supported only speeds up to 57.6K bit/sec.

In addition to sending files over dial-up lines, the software can transmit files between two personal computers linked via an RS-232 cable. In that setup, the software transmits files at rates in excess of 100K bit/sec, the company said.

The file-transfer protocol, HyperProtocol, enables the software to maintain data integrity, even with poor transmission

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ARC
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Citicorp pens $80m deal with MCI for expanded discount services

Opts for continued MCI service over AT&T in some units.

By Bob Wallace
Senior Editor

NEW YORK — Citicorp last week signed a three-year contract with MCI Communications Corp. that extends an existing multiservice plan and is expected to generate $80 million for the carrier over the life of the agreement.

The original agreement, which provided volume discounts for MCI's Prism and 800 calling services and was signed in March 1988, has been expanded to include MCI's Vnet, T-1, international private line and advanced 800 services.

Citicorp declined to say how it plans to use the other services brought into the plan or to estimate savings to be realized as a result of the extended arrangement.

The Citicorp-MCI announcement comes just one week after Citibank N.A.'s U.S. credit card operations signed a three-year, $36 million Tariff 12 arrangement with AT&T ("AT&T chalks up two more users for Tariff 12 deals," *NW,* Nov. 13).

Citicorp had said other company units could be added to the Tariff 12 deal, but Citicorp's bank card, telemarketing and mortgage banking units are already large MCI customers and will likely do more business with MCI as a result of the discount plan, said Daniel Sullivan, a vice-president with Citicorp Technology Office's telecommunications group.

According to Nathan Kantor, president of MCI Northeast, Citicorp does not have to commit to use specific services in the contract.

MCI said Citicorp will use the carrier's Customer Information Manager (CIM) and Network Information Management System (NIMS) to manage a large Vnet the carrier is building for the company.

Citicorp will use the carrier's CIM and NIMS to manage a large Vnet the carrier is building for the company.

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Citicorp will use an on-site CIM terminal to access a Vnet data base to change seven- and 10-digit dialing plans; access a call overflow option; control Vnet access by location, authorization code and employee; and activate and deactivate identification codes.

NIMS will provide Citicorp with on-line access to next-day Vnet operation and performance information. The NIMS package, which runs on the CIM terminal, generates 21 Vnet reports covering areas ranging from trunk measurement to circuit status.

TOPS unwraps new InBox E-mail package with broader net support

By Laura DiDio
Senior Editor

LAS VEGAS — The TOPS Division of Sun Microsystems, Inc. introduced two versions of its InBox electronic mail package for the major local-area network operating system environments at the Comdex/Fall '89 show here last week.

The two new E-mail packages, Version 3.0 of InBox and InBox Plus, run on Apple Computer, Inc. Macintoshes and personal computers, and for the first time, run on networks based on Novell, Inc.'s NetWare and Microsoft Corp. and 3Com Corp.'s LAN Manager. Previously, InBox ran only on Apple's AppleShare and TOPS' own TOPS/DOS and TOPS/Mac network operating systems.

"Users can create their own address book of individual users, entire work groups or even a different LAN."

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The latest releases of InBox also incorporate new features such as the ability to attach files to E-mail messages and an administrative messaging feature that lets users sort mail by date, subject and sender, said Rich Shapero, TOPS' vice-president and general manager.

TOPS engineers spent a year reworking the current InBox E-mail package, which comes bundled with the TOPS network operating system. InBox 3.0 and InBox Plus 3.0 are identical in features and functionality, but InBox 3.0 is aimed at work group LANs of up to 20 users and InBox Plus is for LANs supporting as many as 100 users. InBox Plus incorporates server-to-server communications facilities.

Simplicity, increased functionality and affordability are the issues that concern users most, Shapero said. "The entire InBox 3.0 mail package resides on one floppy disk that takes only about 10 minutes to install — half the time it used to take," he said. "And unlike the earlier versions, it doesn't require central administration."

Prior versions of InBox didn't include message administration functions and network routing capabilities that are now part of InBox 3.0 and InBox Plus. "Until now, the systems administrator had to create lists of messaging addresses and routing tables manually for the entire network. Now users can create their own address book of individual users, entire work groups or even a different LAN," Shapero said.

This is made possible through a new InBox feature that enables users to maintain personal address books. Other new fea-

(continued on page 8)

How To Make Everybody Happy All Across The LAN.

```
NetWare Print Console  V1.02a            Tuesday  September 5, 1989  4:18 pm
       User SUPERVISOR On File Server FARRELL Connection 3

        Print Queues                   Print Queue Information
   PRINTQ_
              Current Queue Status                      Entries
   Number of entries in queue:                        0 tus
   Number of servers attached:                        1 d Servers

   Operator Flags
      Users can place entries in queue:              Yes
      Servers can service entries in queue:          Yes
      New servers can attach to queue:               Yes
```

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COS directors set plan to escape financial downturn

By Gail Runnoe
Washington Correspondent

MCLEAN, Va. — The Corporation for Open Systems International (COS) gathered its board of directors here last week to lay out a strategy designed to reverse the standards organization's revenue fall.

The board came to several conclusions. Among them were plans to expand the use of its testing tools by other agencies; merge with a Manufacturing Automation Protocol/Technical and Office Protocol standards body; expand and promote the COS Mark program; beef up COS membership; and coordinate efforts with a Japanese counterpart.

Robert Metcalfe, COS chairman and vice-president of marketing at local net vendor 3Com Corp., said the steps are necessary to boost revenue. He said 1989 revenue fell short of expectations by about $5 million, and COS consequently posted a $2.3 million loss.

One step will be to pursue a tighter relationship with the National Institute for Standards and Technology (NIST) in order to establish the testing mechanisms for Government Open Systems Interconnection Profile (GOSIP) conformance by suppliers.

> The move would help COS achieve its goal of bringing users and vendors under one tent.
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COS plans to announce a project developed with NIST that will help establish a GOSIP testing infrastructure. COS officials said they would like to see COS test tools used in GOSIP testing.

Metcalfe said COS also plans to pursue a merger with the Information Technology Requirements Council — the parent organization of the North American MAP/TOP Users Group.

The move would help COS achieve its goal of bringing users and vendors under one tent and would increase the likelihood that MAP/TOP and GOSIP protocols harmonize, Metcalfe said.

Other activities will include fostering a closer collaboration with Japan's Promotion Council for OSI, creating a relationship similar to the one COS now has with the Brussels, Belgium-based Standards Promotion and Application Group. The goal of these alliances is to be able to provide worldwide, one-stop OSI conformance testing so users can be assured that products tested in the U.S. will work with those tested abroad.

TOPS unwraps InBox package

continued from page 6

tures include comprehensive mail management, personalized user storage boxes and multiple enclosures.

The comprehensive mail management feature lets users sort E-mail messages by date, subject or sender, and store mail in storage boxes. The storage box feature allows users to store incoming mail on a local disk drive, reducing LAN storage requirements. The multiple enclosure capability enables users to attach any number of binary or text files to their E-mail messages.

InBox 3.0 supports 20 users and has a list price of $329. "That works out to about $25 per user based on the list price, but we intend to offer volume discounts, so it will be even more affordable," Shapero said.

InBox Plus 3.0, which supports up to 100 users, lists for $995. It incorporates all E-mail server-to-server router software, which gives users the ability to store and forward messages to other LANs within a corporate enterprise net. InBox Plus also contains a variety of administrative tools that make it easier to manage E-mail messages on large LANs, Shapero said.

"InBox Plus gives users the ability to determine the frequency that messages are moved from one message center to another. It also gives users the option to determine if they want E-mail messages forwarded from a message center once a day or five times a day," Shapero explained.

Thumbs up

Henry Brattlie, deputy director of the Philadelphia office of the U.S. Department of Immigration, is one of several InBox 3.0 beta-test users. Brattlie said his office is just beginning to put its executives and staffers on Macintosh IIcxs on a TOPS LAN and didn't want to spend the money to buy an additional system that would be used as a dedicated E-mail server.

> "Unlike other E-mail packages, such as Microsoft Mail, InBox 3.0 doesn't require a dedicated PC," Brattlie said. "It's easy to learn, which is important."
>
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"Unlike other E-mail packages, such as Microsoft Mail, InBox 3.0 doesn't require a dedicated PC," Brattlie said. "It's easy to learn, which is important, since most of our users don't have much experience with computers."

Chevron U.S.A., Inc. in San Francisco is another beta tester. It has installed InBox 3.0 at its oil refinery in Richmond, Calif., where it has 40 separate AppleTalk LANs with a total of 250 Macintoshes and 20 personal computers. Most of the users are in small work group LANs of up to 20 people located throughout the facility, which spans more than five square miles, said Bill Silva, Chevron's lead network analyst.

"We chose InBox Plus 3.0 because it enables our LAN users to easily transfer multiple documents to entire departments and attach messages to the documents," Silva said. "InBox 3.0 gives us the facilitywide mail messaging capability we need, without complicating or bogging down the networks."

InBox 3.0, InBox Plus 3.0 and the gateways are expected to ship in January. TOPS will provide free upgrades to InBox 3.0 for its current installed base of 600,000 TOPS users, Shapero said.

To get information on products or services
advertised in this week's issue
of *Network World*,
see the FAXNeT Form on Page45

FAXNeT

MFS contests telcos' lock

continued from page 1

them to be more responsive to users' needs, offer new services and lower rates.

Impossible to lose

At a press conference here, Pompliano said it is "impossible" for him to believe that MFS could lose this battle because the company is on such firm legal footing. Several laws on the books were intended to open local services to competition, but the laws haven't been enforced, he said.

There had been one other challenge to the RBHCs' monopoly on local switched service, filed with the FCC by Teleport Communications Group in New York, but that petition was withdrawn.

New York Telephone Co. voluntarily filed a tariff with the FCC unbundling its switched access tariffs and allowing collocation of equipment after the New York Public Service Commission (PSC) ordered the Bell company to do so at the state level.

The MFS petitions specifically ask the FCC and the Justice Department to initiate a proceeding forcing RBHCs nationwide to interconnect with and allow collocation of MFS equipment in central offices and to unbundle access tariffs so that MFS can purchase only the components it needs. Access tariffs are composed of a number of elements, including charges for transport, switching and information services, as well as surcharges and line charges.

If the FCC and Department of Justice decide in favor of MFS, it will enable the carrier to immediately provide two new interstate services. MFS would be able to put its own channel banks or multiplexers into a central office to consolidate switched traffic coming from various users and then deliver that traffic to an interexchange carrier's point of presence. Currently, MFS can only serve customers in buildings served by its own fiber-optic private lines.

A second related service MFS could provide would be to collect traffic at the central office from a number of locations for a single user and then transport it to the interexchange carrier.

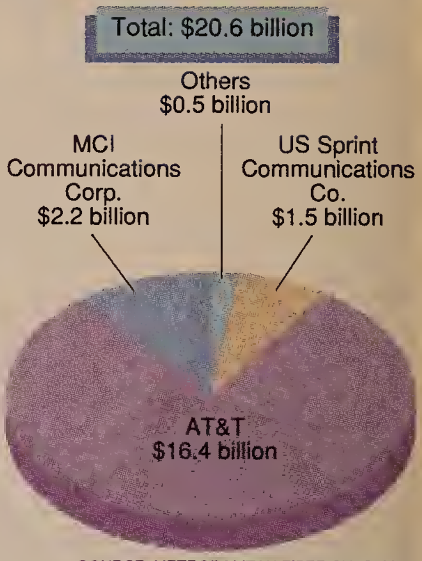
In the event MFS is allowed to offer these services, it would compete with the RBHCs for about 23% of their revenue, or $20.6 billion annually (see chart, this page).

MFS claims no new laws must be written to grant its requests. The carrier is hoping that the FCC will agree with MFS' interpretation of Section 201 (a) of the Communications Act of 1934, which mandates that common carriers must allow other providers to establish physical connections with their networks to include the RBHC local loop.

MFS is also asking the Department of Justice to apply to switched services a rule in the Modified Final Judgment that says access tariffs shall be offered on an unbundled basis and that tariffs cannot require carriers to pay for types of access that they don't use.

Pompliano said he is sure MFS has enough legal ammunition to prevail in its battle, but he admits that it may take several years to settle the issue. However, MFS had no other recourse because it has been unable to negotiate voluntary access agreements with individual Bell companies.

What the long-haul carriers pay in BOC access fees



SOURCE: METROPOLITAN FIBER SYSTEMS, OAKBROOK TERRACE, ILL.
GRAPHIC BY SUSAN J. CHAMPENY

More than one means

Robert Atkinson, senior vice-president of regulatory and external affairs at Teleport, another alternative provider of local private-line services, said MFS could have chosen to work with state regulators and individual carriers instead. Since 1987, his company has been pursuing a virtually identical set of demands, including collocation and unbundling of tariffs, at the state level.

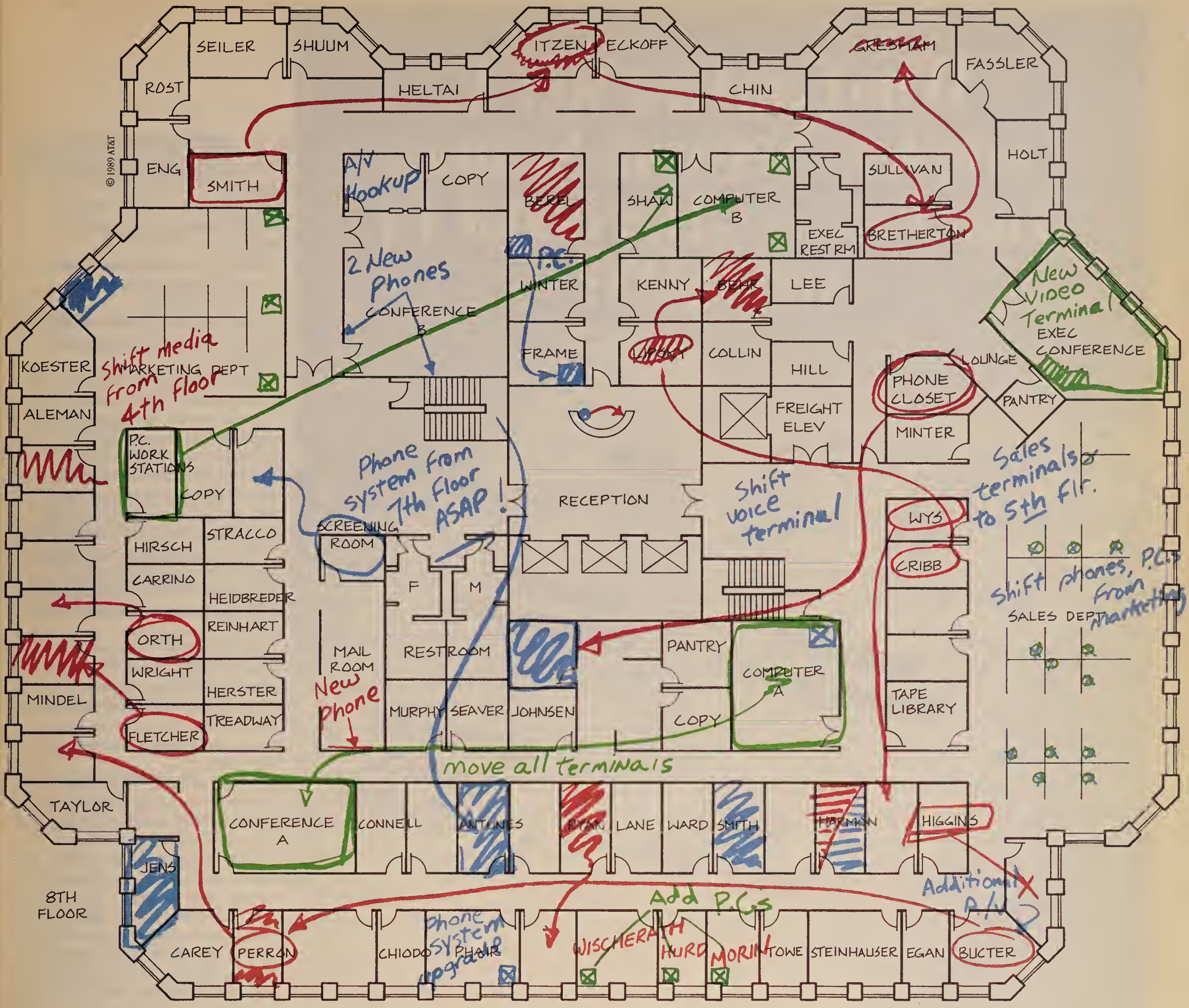
Atkinson said Teleport decided that working with state regulators on a case-by-case basis would be the most productive approach, holding up as proof the favorable ruling from the New York PSC this year.

Because MFS has taken a more public approach, it may encounter a good deal of resistance, Atkinson said.

"The [RBHCs] are going to pile up reports and studies, and it's going to take years and years [for the FCC to decide]," Atkinson said. He also said he thinks state regulators may object to the MFS petition out of concern that the FCC might be overstepping its jurisdiction in issuing such as ruling.

Mark Lowenstein, telecommunications analyst with The Yankee Group, a Boston-based research firm, wonders whether MFS may have taken on too large a battle. MFS is a young company and, like most alternative service providers, it is trying to establish a firm footing, he said.

"I don't know whether [MFS] diversifying itself at this point is the best marketing strategy," Lowenstein said.



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INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS AND FINANCIALS

Worth Noting

"Traditional forms of telephone regulation were designed to provide customers in a monopoly marketplace [with] the same benefits and protections that competition would, if it were present. But in today's environment, traditional regulation has more downsides than benefits."

Robert Barnett
President
Ameritech Bell Group
Chicago

People & Positions

Network Equipment Technologies, Inc. last week named **Daniel Warmenhoven** to the post of president and chief operating officer. Warmenhoven succeeds **Bruce Smith** as president; Smith was elected chairman.

Most recently, Warmenhoven was general manager of Hewlett-Packard Co.'s Information Networks Group, where he oversaw the development, manufacturing and marketing of HP's communications products.

Warmenhoven will assume responsibility for all operations at the Redwood City, Calif.-based provider of wide-area network tools, including T-1 and T-3 equipment and net management software.

NET's Smith, who founded the company in 1983, retains his role as chief executive officer, while taking on the role of managing the firm's board of directors.

Also, NET announced the resignation of **Fred Glave**, senior vice-president of the company's private networks division.

Artel Communications Corp., a Hudson, Mass.-based

(continued on page 52)

Low prices to spur growth in mobile satellite market

Shift to L-band frequency seen as plus for users.

By Gail Runnoe
Washington Correspondent

STAMFORD, Conn. — The market for mobile satellite systems is expected to explode over the next five years, growing at a 150% annual clip, according to studies conducted by Gartner Group, Inc., a market research firm based here.

The declining cost of mobile satellite systems — communications systems used to relay short data bursts to and from a central location and moving vehicles such as freight trucks or trains — is the primary factor fueling market growth, said John Pemberton, program director at Gartner Group.

As vendors have managed to downsize equipment — a mobile satellite dish is roughly six inches in diameter now — the cost of terminal equipment has dropped, spurring sales.

New transmission technologies have also boosted the capacity of satellite networks, enabling mobile network providers to spread operating costs over millions of customers, passing on savings in some cases, he said.

Pemberton expects mobile satellite systems will have their greatest impact on the banking, insurance, retail, and oil and gas industries, as well as the transportation industry.

Mobile satellite systems, he said, "reduce information float in field operations" and give companies on-line control of remote operations. "This changes the whole information systems structure for supporting field operations," he said.

John Pemberton

Pemberton predicts that by 1995, the number of installed mobile satellite system terminals will grow from the present

(continued on page 16)

INDUSTRY BRIEFS

AT&T Computer Systems in Morristown, N.J., recently announced the formation of **AT&T Computer Systems — International**, a new organization devoted to increasing AT&T's business outside the U.S. AT&T Computer Systems is a business unit of AT&T's Data Systems group.

The new international group will initially sell AT&T's 3B2 minicomputer and 6386 personal computer lines, as well as Starlan 10 local-area network products in Europe.

Heading up the new organization will be John Boyd, previously vice-president for worldwide complementary marketing at AT&T Computer Systems. He will be responsible for overall operations, including management of computer-related activities with Istel, Ltd., the British information technology services firm that AT&T announced its intention to acquire last month.

Infotron Systems Corp. last week announced it will resell **Advanced Compression Technology, Inc.**'s existing and future subrate voice/data multiplexers under a multiyear OEM agreement.

The Advanced Compression Technology offerings will enable Infotron to provide users with a networking product that links remote sites into a network via subrate digital circuits and analog leased lines, said James Tung, vice-president for Far East operations at Infotron. The products will particularly appeal to customers with remote sites overseas, he said.

US Sprint Communications Co. last week announced it has extended the reach of its SprintMail 400 (formerly

(continued on page 52)

Changing face of terminal markets

Text terminals only

Year	Millions of units		Millions of dollars	
Shipments	Shipments	Installed base	Shipments	Installed base
1988	1.571	8.530	877	8,082
1989	1.681	9.651	923	8,408
1990	1.764	10.635	899	8,311
1991	1.832	11.554	891	8,184
1992	1.886	12.381	874	8,089
1993	1.925	13,191	834	7,978

Shipments of ASCII/ANSI terminals will grow by only 4% between now and 1993, as vendors are forced to sell more units to maintain current revenue levels.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.

Terminal suppliers address net demands

To protect their market share from networked PCs, terminal vendors are expanding their lines.

By Bob Brown
Senior Editor

As users shift from host-based terminal networks in favor of networked personal computers that share file servers, terminal makers are reshaping their product lines to meet the changing market.

Commodity terminals are still in demand, but suppliers increasingly are retooling their factories to push out diskless workstations for local-area networks, X/Windows terminals and other products that pack a high degree of connectivity with intelligence not common in dumb terminals.

Even though terminal sales continue to grow, terminal vendors are waging a price war and, consequently, must ship more units to keep their revenue from slipping, industry watchers said.

Vendors that continue to satisfy the needs of traditional terminal users as well as the newer requirements of users that need more punch at the desktop will prosper, they said.

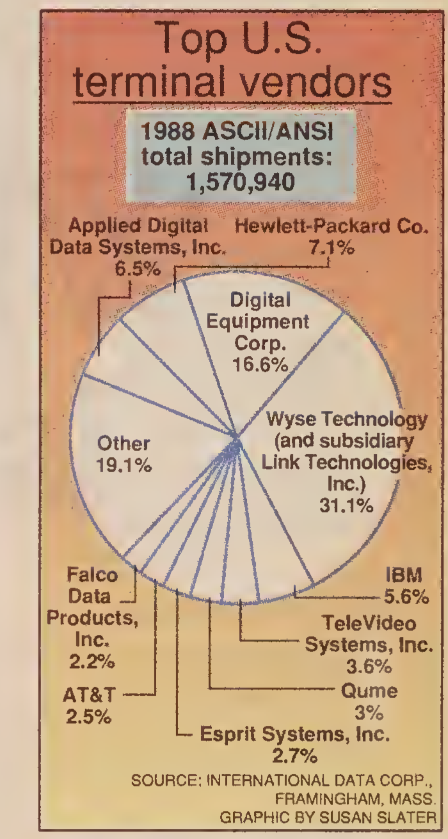
Smartening up

Users contacted by *Network World* described a shift in their network buying patterns away from dumb terminals and toward more intelligent desktop devices.

Union Carbide Industrial Gases, Inc., for example, is in the midst of a redesign that involves consolidating six networks into an X.25 packet-switched backbone that supports multiple vendors' architectures ("Union Carbide subsidiary builds X.25 network utility," *NW*, July 17).

The project has enabled the Danbury, Conn.-based company to swap vendor-specific terminals for personal computers that give users access to four distinct computing environments.

Such user preferences for intelligent desktop devices are becoming more common as users seek to off-load processing from large host computers to desktop devices where end users have become much more adept at handling network chores, said Eileen O'Brien, terminals program manager at International Data Corp. (IDC), a Framingham, Mass.-based market research firm.



Top U.S. terminal vendors

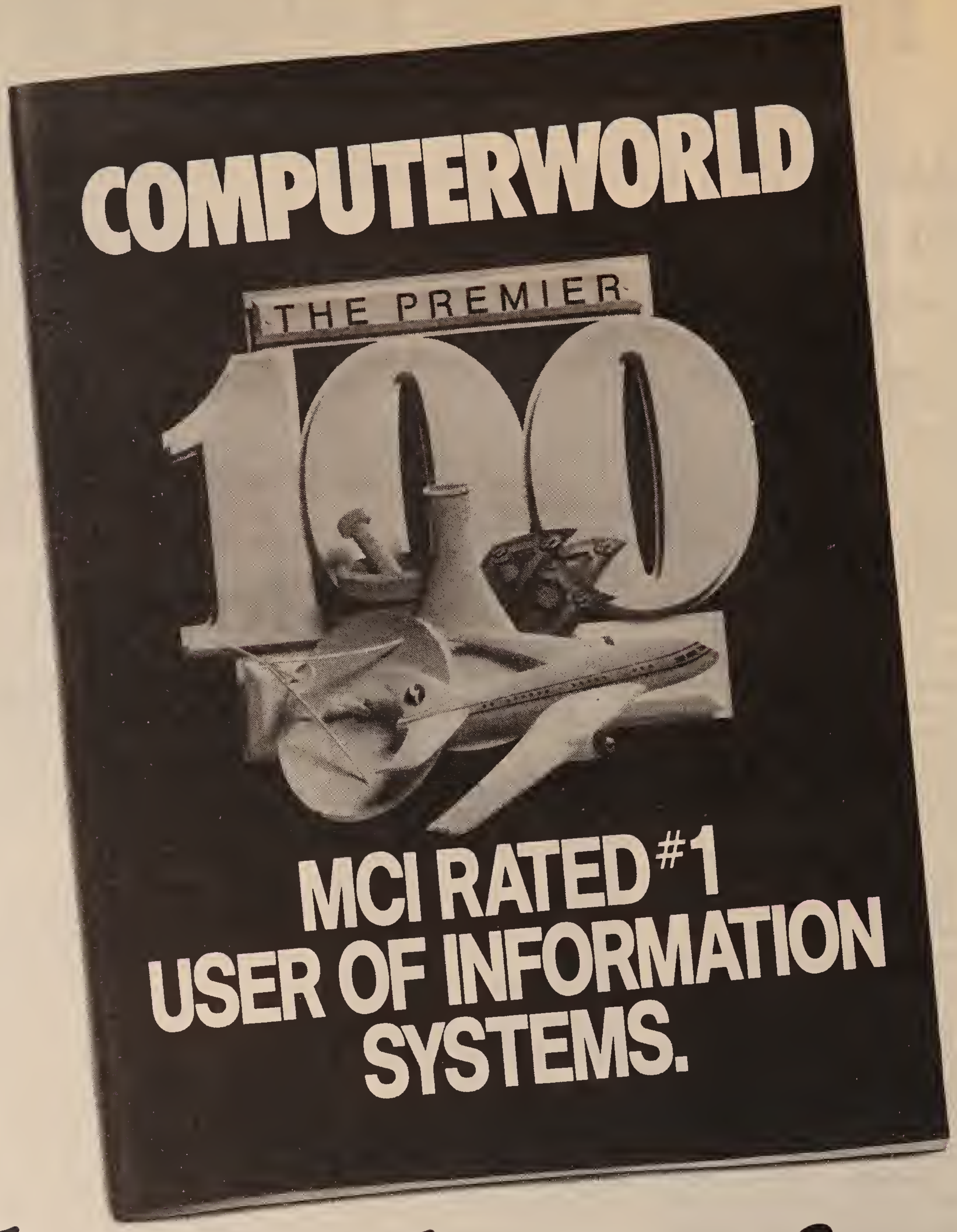
SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.
GRAPHIC BY SUSAN SLATER

The best evidence that confirms this trend toward increased intelligence and connectivity in desktop devices can be seen in terminal market forecasts.

Combined ASCII/ANSI terminal shipments are expected to grow 6.5% annually between 1985 and 1993, according to IDC research. But that growth rate is expected to slip to 4.1% during the 1988 to 1993 period.

Meanwhile, the market for diskless personal computers, which are replacing dumb terminals at many user sites, has taken off. For example, vendors shipped 68,340 diskless worksta-

(continued on page 13)



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Suppliers address net demands

continued from page 11

tions last year, more than double the 1987 total of 33,975 units, O'Brien said.

Diskless workstations offer large amounts of main memory to handle application processing locally but do not have built-in disk drives for local storage, instead relying on network servers for file storage.

These devices deliver personal computer-like networking and performance at a moderate price and with the added security feature of storing data on a network server, O'Brien said.

"The PC has been publicized as [having] a lot more whizbang than the terminal," O'Brien said. "But I would think that for MIS managers making purchasing decisions, an awful lot is based on economics. If you can get a terminal to do the job for $499, why would you pay $1,000 or more for a PC? The diskless PC is a more affordable alternative."

Broader horizons

Major terminal vendors insist that terminal sales are growing at a healthier clip than market researchers suggest. Nevertheless, vendors said they are placing increased emphasis on the market for "processing terminals" — a popular term for diskless workstations and X/Windows displays.

> "The PC has been publicized as [having] a lot more whizbang than the terminal."
>
> ▲▲▲

"The shift we have seen is to higher feature terminals," said Ed Schenk, vice-president and general manager of the displays division for Applied Digital Data Systems, Inc. (ADDS) in Hauppauge, N.Y. "The market is not necessarily looking for a less expensive terminal, but users want a lot more features for the money," he said.

ADDS, the terminal division of NCR Corp., has focused on enhancing its terminals in several ways, Schenk said. Among the most popular enhanced products are personal computer terminals that hang off of host personal computers rather than mainframes, or terminals that link to dual hosts or dual ports for multitasking purposes, he said.

Wyse Technology, the ASCII/ANSI terminal market leader according to IDC, is looking to products from its network terminal group to provide future growth. About a year ago, Wyse introduced its WY-212 Networker diskless workstation to meet the changing requirements of end users, said Joy Pinsky, Wyse's marketing manager.

"We see networking as a good opportunity to expand our business," Pinsky said. The Networker links to a network server, she said.

Dianne Guthmann, Wyse's product manager, added, "Instead of letting the PC market overcome us, we're trying to take advantage of PCs." Wyse, which is discussing an acquisition offer by a Taiwan consortium, reported a $3.6 million loss in the quarter ended Sept. 30, largely the result of a poor performance by its personal computer business, analysts said.

"X" marks the spot

Another alternative to basic terminals are X/Windows displays, said Abbot Gilman, Digital Equipment Corp.'s marketing manager for video, image and printer systems. X/Windows displays are windowing terminals that offer a high degree of network connections while also offering the capability to display multiple applications concurrently on a single screen, he said. They are priced between a plain terminal and a personal computer, he added.

DEC, a leader in the terminal market, plans to have a line of X/Windows display products available next year that will "fill a void," Gilman said.

"There is a segment of the market above the vanilla text terminals and graphics terminals, and below the workstations and PCs. That's the new market that we're addressing with windowing terminals," Gilman explained. ▣

Hughes' New Ku-Band Fleet Has Businesses Everywhere Looking Up

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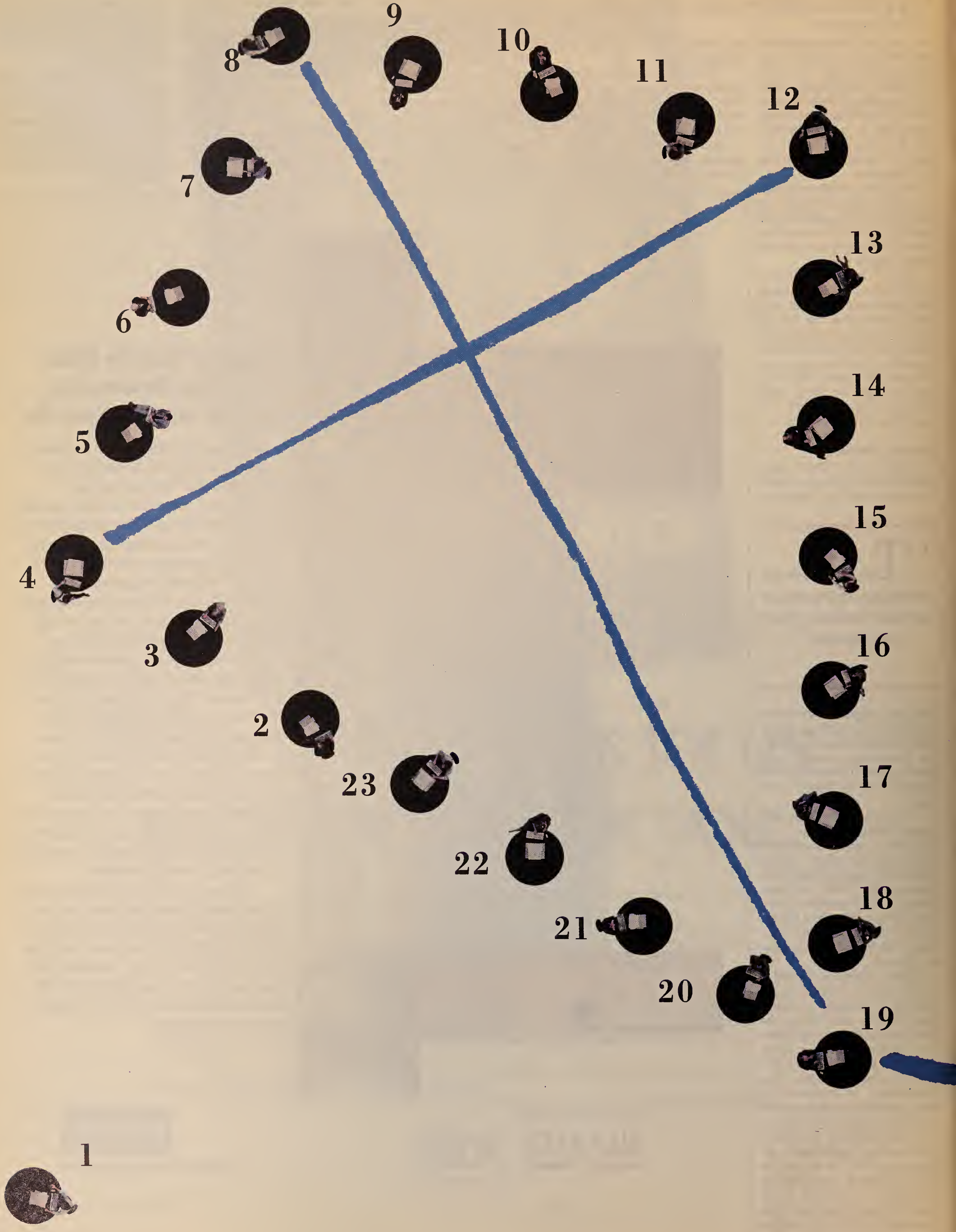
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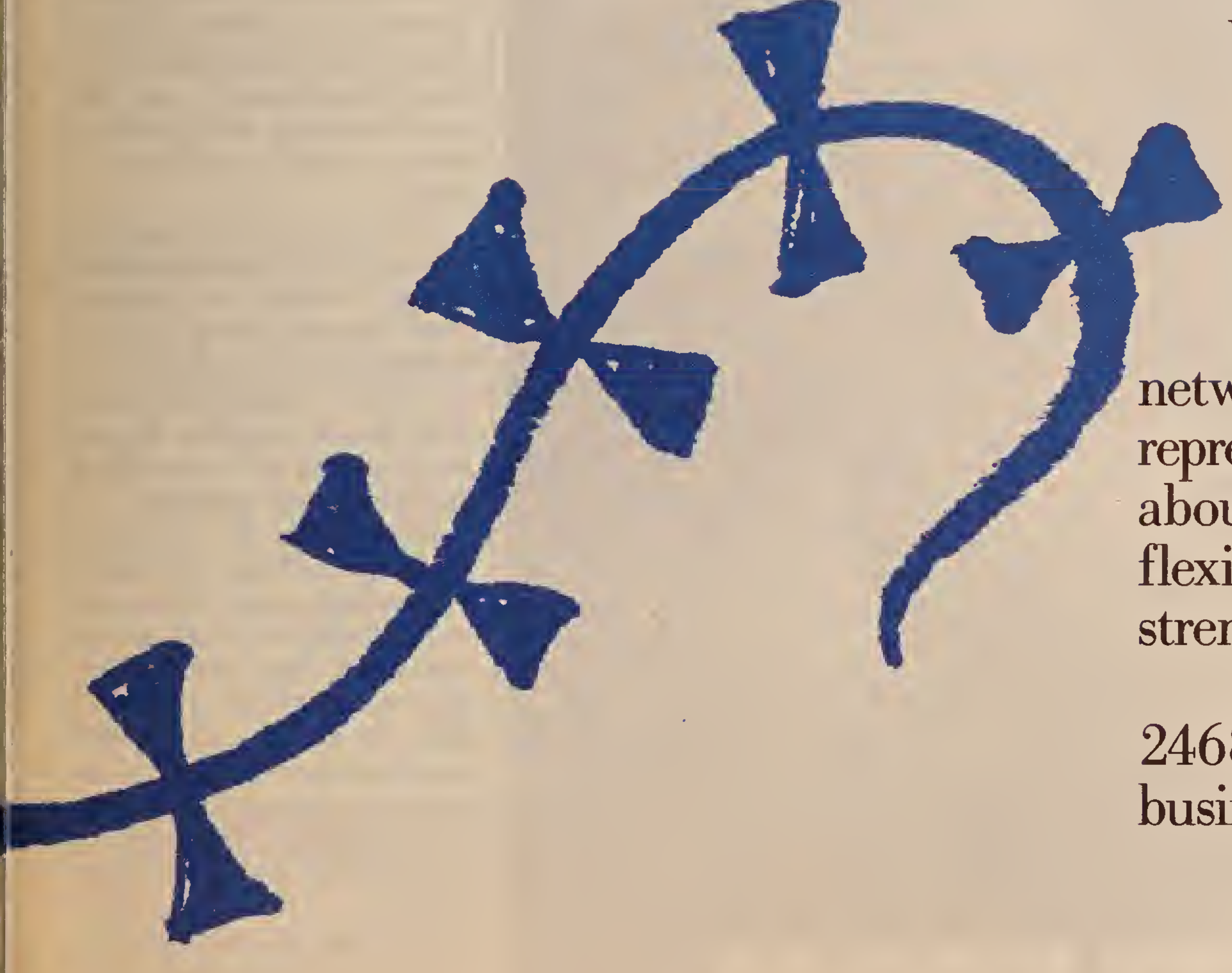

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Low prices to spur growth

continued from page 11

20,000 to two billion. While mobile satellite systems are currently used mainly for data transmission and position detection, Pemberton said electronic data interchange will also work well with this technology.

Order entry data, for example, can be messaged over mobile satellite systems, he said, to help support just-in-time inventory systems.

Transportation and package delivery companies are frontrunners today in deploying mobile satellite systems, Pemberton said. This is because they can improve their service by offering tracking updates to manufacturers and retailers with just-in-time operations.

These demands spurred Key Way Transport, Inc., a nationwide trucking firm based in Baltimore, Md., to promise Sony Corp. of America it will beta-test Sony's two-way mobile satellite system, the 2-Wayfarer Mobile Communications Unit, said Dennis Morgan, vice-president of administration at Key Way.

"You can provide better service when you have better information," Morgan said. "When you don't know where the truck is, all you can do is worry." Morgan said he believes that in the future, companies without a mobile satellite communications system will not be able to compete with others that do.

Financial security

The insurance and banking industries could also use mobile satellite systems to better manage information, Pemberton said. By using a portable data entry keyboard attached to a mobile satellite dish, insurance representatives would be able to do onsite claims processing, a crucial capability in disaster situations such as Hurricane Hugo or the earthquake in California, where terrestrial lines were either down or jammed, Pemberton said.

But mobile satellite systems will not be installed only for mobile purposes, Pemberton projected. Banks, he said, are looking into using the technology to create more efficient automated teller machine networks.

While some banks carry their ATM traffic over very small aperture terminal networks, Pemberton said mobile satellite systems could be more cost-effective. "ATMs transmit very short data records," he said, "and it's very possible some banks will find an economic windfall by using mobile satellite systems instead of VSAT networks."

The price is right

Price is the main reason users are expected to flock to mobile satellite systems. In recent years, VSAT terminals — priced from $15,000 to $20,000 — were the least expensive satellite dishes, Pemberton said. Today, however, mobile satellite terminals, which emerged in the market just last year, cost users about $4,000, he said, and are expected to drop to $2,000 by 1992.

One reason prices have come down is because systems are using L-band frequency — a subset of the UHF frequency that operates at 1 GHz to 2 GHz — allowing users to install terminals of about six inches in diameter.

Other factors spurring growth in the industry are technological innovations, including spectrum coding, which enables unique terminal identification, and spot beam switching, which allows a vendor to divide and reuse frequency.

Pemberton said the number of suppliers in the mobile satellite systems market is relatively small because start-up costs — usually about $400 million — are prohibitive to many companies. Some market suppliers, he said, are positioned to do very well in particular market segments.

QUALCOMM, Inc., based in San Diego, is doing very well in the trucking market, Pemberton said. Although the vendor's systems use Ku band and a slightly larger terminal dish of about 12 inches in diameter, QUALCOMM gained an early foothold in the market by entering the arena before a number of L-band players.

Geostar Corp., based in Washington, D.C., offers L-band services and has a strong presence in the transportation arena, Pemberton said. And American Mobile Satellite Corp. is carving out a niche in the aeronautics sector.

Locstar, a consortium of companies from 10 European countries, is expected to do well in Western Europe and the Middle East, he said. ◼

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TELECOMMUNICATIONS

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Worth Noting

The National Centrex Users Group (NCUG) recently announced the *NCUG Vendor Source Book,* a free 20-page directory listing companies that manufacture, sell or distribute everything from Centrex station equipment to telemanagement systems. The book can be ordered by writing to NCUG at P.O. Box 319, Novi, Mich. 48050.

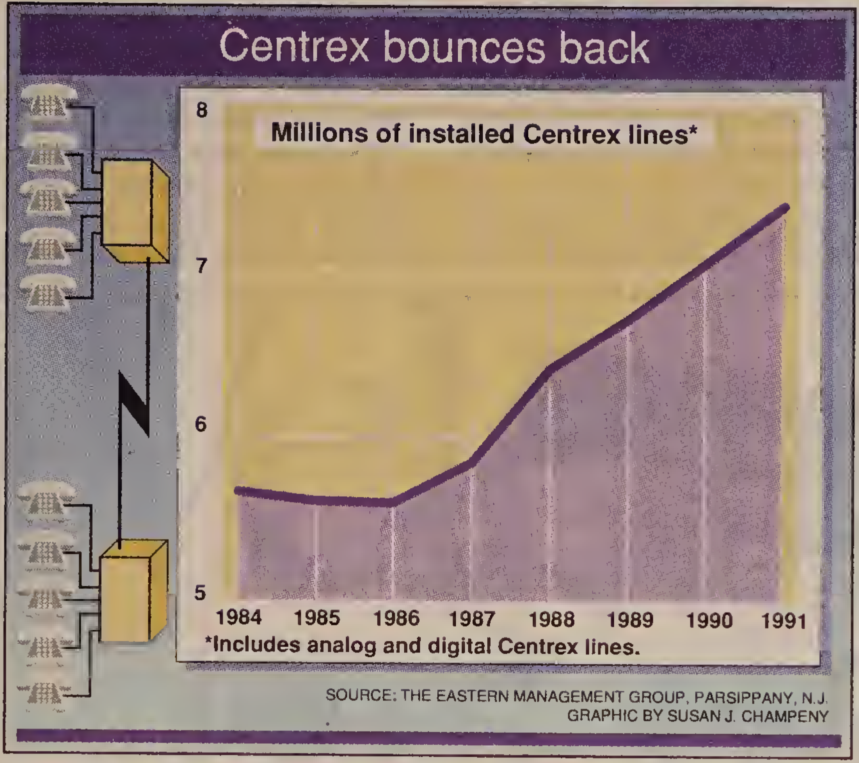
Carrier Watch

US Sprint Communications Co. recently reduced rates for its all-fiber T-1 service, Clearline 1.5, by up to 50%, effective Nov. 1. The company had originally said last September that it would reduce T-1 service rates by up to 28% and lower the starting point for volume discounts from $20,000 per month to $10,000 per month.

But it decided to deepen the reductions after examining T-1 rate cuts filed with the Federal Communications Commission by rivals.

Nevada Bell recently began offering a voice mail service to Centrex users and will extend the offering to non-Centrex business customers in the third quarter of 1990.

The service's Usage Sensitive Option is designed for customers with moderate voice mail traffic and includes a onetime $15 installation charge for each mailbox, a $10 monthly recurring charge and a 10-cent fee for each minute of usage. The Flat Rate Option is targeted at higher volume users. Companies that buy one to 24 mailboxes pay a $19.85 monthly charge, while users with more than 25 mailboxes are charged $15.95 a month. This option also includes a $15 installation charge per mailbox. There are no usage charges.



Centrex bounces back

*Includes analog and digital Centrex lines.

SOURCE: THE EASTERN MANAGEMENT GROUP, PARSIPPANY, N.J.
GRAPHIC BY SUSAN J. CHAMPENY

Health group signs bulk buying pact with AT&T

Agreement to save users $30m over 3 years.

By Bob Brown
Senior Editor

LOUISVILLE, Ky. — MedEcon Services, Inc., a group buying organization for the health care industry, recently announced a bulk purchasing agreement with AT&T designed to save users $30 million over three years.

Under the three-year, $100 million agreement, MedEcon will work with AT&T to sell a range of network services and equipment to the purchasing group's 1,300 health care members across the country.

The contract calls for AT&T to provide long-distance service for operator-assisted or credit card calls from patients' rooms or public telephones, direct-dial services, AT&T 800 Service, as well as telephone switches and facsimile machines.

"We are offering this new telecommunications package because telecommunications represents such a significant portion of annual health care institution expenditures," said William Wooldridge, MedEcon's president.

The contract is one of a growing number of bulk buying agreements carriers have agreed to in recent months ("Users band together for service discounts," *NW,* Oct. 23). The American Business Network Limited Partnership, a Lyndhurst, N.J.-based consortium of 60 network users, last week signed a $25 million contract with MCI Communications Corp. for voice and data services.

MedEcon's 28-person sales force will identify likely AT&T users and then join AT&T sales representatives on joint sales calls to pitch the equipment and services, said Niklaus Fincher, MedEcon's equipment program director. MedEcon will market AT&T's telecommunications products and services exclusively, he said.

MedEcon charges members a yearly fee, and its sales representatives will make commissions on sales of AT&T products and services.

Tailor-made services

AT&T offers a number of network services that are particularly suited to the health care field, Fincher said.

For example, AT&T's new Execu-Bill service offers individualized billing and reporting capabilities for corporations with employees who use telephone calling cards.

MedEcon's agreement will enable health care facilities to extend this service to physicians' offices to promote goodwill, Fincher said.

Margaret Mason, manager of consulting services at The Kennedy Group, a Redwood City, Calif.-based health care information system consulting firm, agreed.

"Hospitals are increasing or improving their remote communications with physicians to create physician bonding," said Mason, whose firm recently conducted a study on hospital usage of computers and networks.

Hospitals can increase their patient turnover and, consequently, their revenue, by doing anything that makes life easier for physicians, such as setting up better communications links or offering communications-related perks, she said.

Neither MedEcon nor AT&T would reveal exact discounts on AT&T services and equipment covered by the agreement.

Battle lines drawn on AT&T market status

FCC to hear arguments, decide if AT&T should still be considered dominant long-haul carrier.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — Comments filed by long-distance carriers last week indicate that a rancorous battle is brewing over an upcoming FCC examination that could determine if AT&T will continue to be defined as a dominant carrier.

Rival carriers contend that AT&T is still overwhelmingly dominant with 70% of the long-distance market and that the Federal Communications Commission could destroy the competitive market by ruling otherwise.

The carriers also claim that giving AT&T too much flexibility will allow the company to reestablish itself as a monopoly, which the carriers say would almost certainly hamper innovation and lead to higher prices.

AT&T claims the opposite — that the marketplace is highly competitive and the current burdensome regulation has stifled its ability to be an innovator and kept prices artificially high.

The battle lines were drawn last week in response to a proposal from the Alternative Carrier Telecommunications Association suggesting that the FCC set up a two-step proceeding. The first step would examine whether AT&T still holds a dominant market position, and the second would propose regulatory changes based on AT&T's status.

Every major carrier that filed comments, including MCI Communications Corp., US Sprint Communications Co., the National Telecommunications Network (NTN) and the Competitive Telecommunications Association (COMPTEL), supported the two-step process.

They said the true status of the marketplace is so unclear that a careful study of the factors that

(continued on page 22)

> Rivals contend that AT&T is still dominant with 70% of the long-distance market.

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WASHINGTON UPDATE

BY ANITA TAFF

No more bureaucratic rivalry. Federal Communications Commission Chairman Alfred Sikes called for increased cooperation between state and federal regulators at a meeting of the National Association of Regulatory Utilities Commissioners (NARUC) in Boston last week. Too many times in the past, "bureaucratic rivalries" between regulators have caused them to forget they are all working to ensure that the public has the best possible telecommunications services, he said.

State regulators are at a critical juncture, Sikes said, and he promised he will sponsor a regulatory summit next spring to serve as a forum for fostering cooperation. He told the regulators there are at least five major areas in which state and federal agencies must work together.

First, he challenged the regulators to define what the telecommunications industry should provide to the public — just dial tone or a broad array of enhanced services. Second, he asked the state groups to consider the most cost-effective way to achieve these goals.

Sikes also urged NARUC members to take a hard look at current state regulations and work to harmonize them with federal regulations to avoid working at cross-purposes.

The group of regulators was also asked to view the telecommunications industry as a diverse and vital marketplace in which various participants have widely differing concerns and incentives. And finally, Sikes asked the group to work with him to rekindle meaningful dialogue between state and federal regulators.

AT&T adds second user to existing Tariff 16 net deal

By Gail Runnoe
Washington Correspondent

AUSTIN, Texas — The University of Texas (UT) at Austin recently contracted for an outbound calling plan that AT&T had previously offered to another user under a custom Tariff 16 deal.

This is the first time AT&T has sold one of its existing customized calling services to a second user and may quiet opponents who say these deals are targeted at single customers.

Under the UT Austin contract, the university will use AT&T's Government Outbound Calling Plan (GOCP) to support service from AT&T's Austin central office switch to other states, Puerto Rico and the U.S. Virgin Islands. The GOCP plan was first offered last month to the Commonwealth of Pennsylvania.

The value of the contract is about $500,000 annually, said Tom Morris, university communications superintendent. The contract runs for one year with an option to extend for a second. Morris projected that the university will save more than $100,000 annually, compared with what it currently pays US Sprint Communications Co.

US Sprint won the business three years ago because its service was priced lower than the Megacom service AT&T proposed at the time. The Tariff 16 GOCP plan, which provides the operational equivalent of Megacom, undercut US Sprint's latest bid by 22%. The AT&T Tariff 16 offer also beat out MCI Communications Corp.'s bid by 26% and ATC/Claydesta Communications, Inc.'s bid by 9%.

Opponents of these custom calling plans claim the packages are merely vehicles for AT&T to discount existing services for specific customers. AT&T offers other custom services under Tariffs 12 and 15.

UT Austin's new AT&T outbound service is scheduled to be cut over on Dec. 17. US Sprint will continue to provide intrastate long-distance service for the university's students and faculty, and AT&T will continue to provide interstate, inbound service under Megacom 800.

"Competition has been good for us," Morris said. "My function is to provide the university with quality long-distance service at the best possible price. In that respect, this is a very good service."

Morris projected that the university will save more than $100,000 annually, compared with what it currently pays US Sprint.

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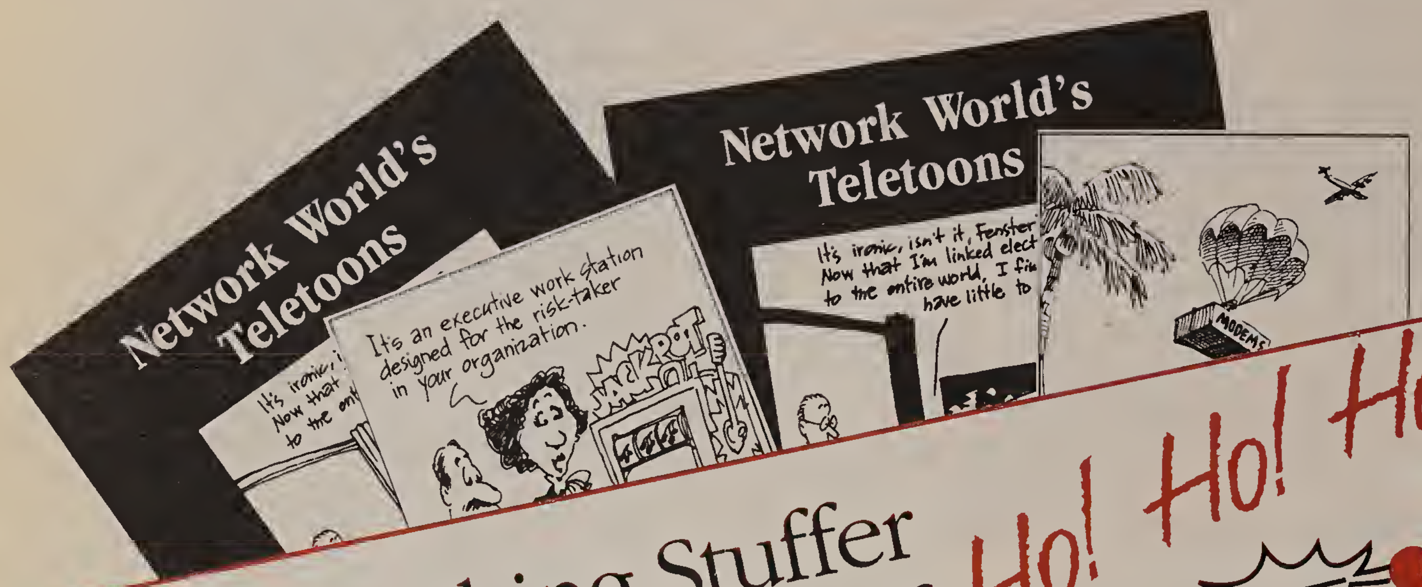
Charges under UT Austin's GOCP plan include a service establishment charge, a monthly service charge, and time-of-day and distance-sensitive usage rates, which AT&T's filing said would be identical to usage rates offered to Pennsylvania.

Actual rate tables in the filing, however, show usage rates during day hours are consistently lower for UT Austin than for Pennsylvania.

Under the UT Austin offering, the per-minute prices during business hours are 7.9 cents for a 50-mile call, 8.7 cents for a 500-mile call and 11.09 cents for a 5,000-mile call.

Under the Commonwealth of Pennsylvania plan, the per-minute prices during business hours are 8.5 cents for a 50-mile call, 11.6 cents for a 500-mile call and 14.3 cents for a 5,000-mile call.

When questioned about the discrepancy, an AT&T spokesman said the company had made a wording error in the UT Austin filing. The filing should have read that the two offers would have identical usage rate structures — both based on the same mileage bands and time-of-day divisions — while actual prices would differ. The spokesman said the company would notify the Federal Communications Commission of this correction. ◘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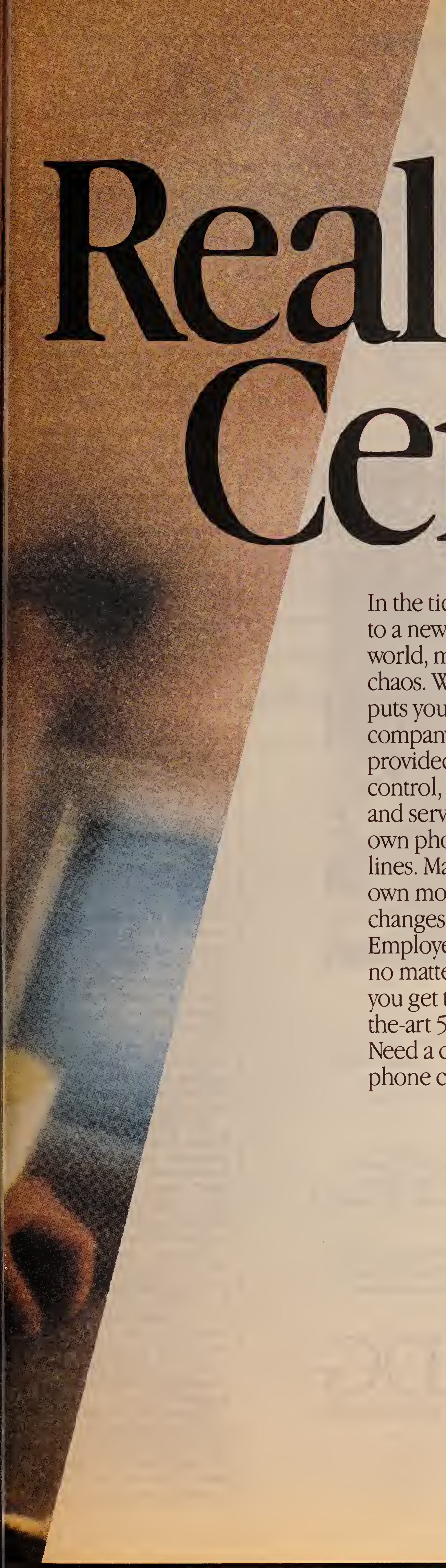

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Lines drawn on AT&T status

continued from page 17

should be considered must take place.

Before the FCC moves to reduce current regulation, it must determine market power, whether the telecommunications industry should be treated as one single market or as a collection of separate services, as well as the future outlook for rival carriers.

For its part, AT&T said there is already ample evidence that it no longer retains market power and the FCC should skip a lengthy inquiry.

Sweeping revisions

The agency should move instead to immediately propose a long overdue "sweeping revision" of regulation for interexchange carriers, AT&T said.

Many of the carriers filing comments last week complained that AT&T has distorted regulators' views of its position in the market and has been able to gain a large degree of regulatory freedom through the tariff process. A public inquiry into AT&T's status is the only way to stop the carrier's continued piecemeal deregulation, they said.

Shepherd said that even if AT&T's market share dropped by 2% annually, AT&T would maintain substantial control over the market for at least the next five years.

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COMPTEL said that no matter what determination the inquiry yields, it will at least end "the tortuous deregulation-by-a-thousand-cuts method that has characterized AT&T tariff proceedings."

Until now, AT&T has gained increased market flexibility by exaggerating the strength of its competitors and its loss of market share, the association said.

Bringing out the truth

A public proceeding will bring out a truer picture of AT&T's position, which, according to FCC filings for the second quarter of 1989, show that AT&T's share of total minutes of usage did not decline and that its growth rate was greater than many of its competitors, COMPTEL said.

US Sprint agreed that "there can be no real question that . . . AT&T still retains substantial market power."

Despite this, US Sprint said the FCC has given AT&T greater regulatory freedom over the past few years, allowing the carrier to proceed with activities that raise serious legal questions.

Illegal discounts

As examples, US Sprint pointed out that: Tariffs 12, 15 and 16, which the carrier claims illegally provide discounts to single customers; AT&T promotions and "misclassifications" of services it says violate price cap rules; and six instances in which AT&T has allegedly tried to tie its regulated services to equipment deals.

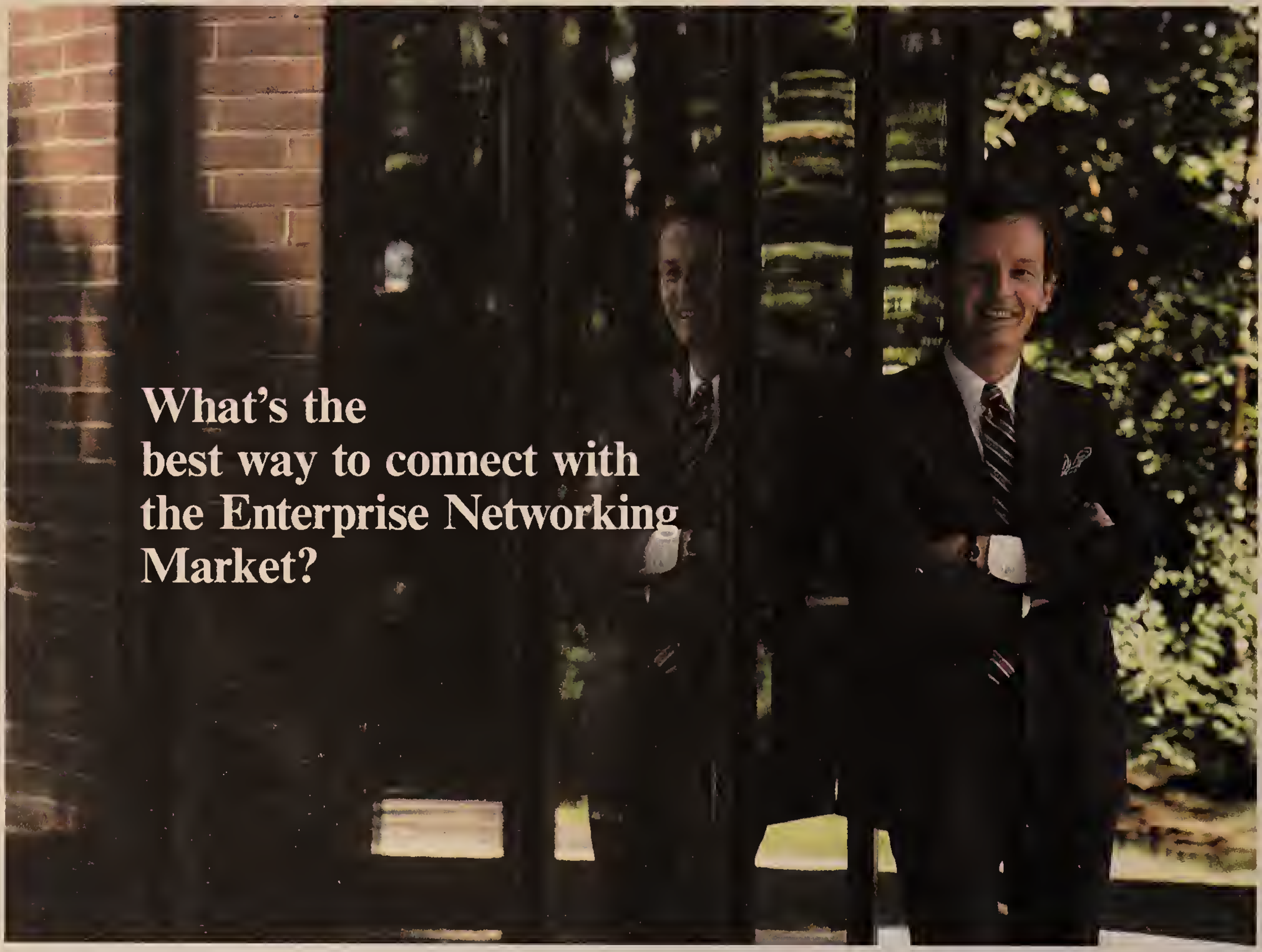
NTN strongly supported an inquiry into AT&T's market status, saying it will become clear after the examination that AT&T cannot be deregulated.

NTN submitted a study from William Shepherd, professor of economics at the University of Massachusetts, which stated that AT&T's degree of dominance "is almost unheard of in the U.S. economy" outside of regulated monopoly utilities.

Shepherd concluded that AT&T received about 75% of the revenue in the long-distance market in 1988 — six times more than its nearest competitor. He claimed that courts have often ruled that a monopoly exists in instances where the gap between competitors' returns are much narrower.

Shepherd also said that even if AT&T's market share dropped by 2% annually, AT&T would maintain substantial control over the market for at least the next five years.

Gary Beach, Publisher, *Network World*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Worth Noting

> "Our competitors are still trying to figure out how to connect their own computers together. We did that years ago, so now we can concentrate on connecting their computers to DECnet."

Dom LaCava
Vice-president
Low-end systems
Digital Equipment Corp.
Maynard, Mass.

Data Packets

Systems Strategies, Inc. recently announced LU 6.2 token-ring support for its ezBridge line of software that links IBM equipment with Digital Equipment Corp. VAXes.

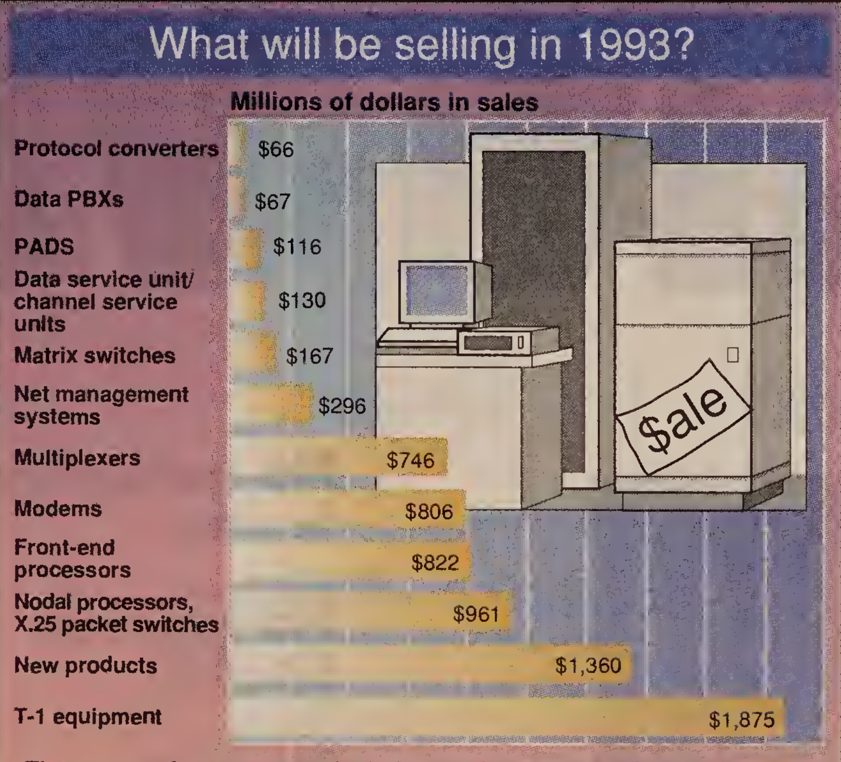
The new ezBridge Token-Ring software gives VAX/VMS users on a DECnet network high-speed access to IBM Application System/400s, System 3Xs and Personal System/2s on a token-ring local net. Via one token-ring attached VAX, outfitted with the new software, any VAX on a DECnet can access any system on the token-ring.

The product will be available in March. Pricing ranges from $10,000 to $25,000, depending on configuration.

Systems Strategies is located at 225 West 34th St., New York, N.Y. 10001, or call (212) 279-8400.

The Leading Hotels of the World, a company that represents over 200 luxury hotels and resorts worldwide, has become the first independent hotel company to sign on for **Wizcom International, Ltd.**'s hotel reservation net.

Wizcom's ResAccess network, announced in March, gives hotels access to a bevy of major airlines' computerized reservation systems. Also with ResAccess, travel agents get room rates, availability data and confirmations from the Leading Hotels network. ◘



The new products category includes products that will be developed in each of the other 11 categories. Most notable among the new products will be fractional T-1 equipment and T-3 multiplexing equipment.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: FROST & SULLIVAN, INC., NEW YORK

Hertz picks AT&T to build cost-saving data backbone

Firm hopes to cut costs, centralize net control.

By Bob Brown
Senior Editor

OKLAHOMA CITY — The Hertz Corp. recently awarded AT&T a five-year contract to build a nationwide data backbone that will eliminate costly dedicated links from remote sites to its net center by shifting remote traffic onto the backbone.

The network overhaul is designed to protect Hertz's investment in its current network equipment and centralize management of existing networks supporting about 1,500 car rental locations, as well as marketing and finance offices.

Under the agreement, Hertz will install AT&T's Datakit II Virtual Circuit Switch at 22 regional network sites, making it one of the first users to widely install the product.

Officials at Hertz's network center here, citing competitive reasons, declined to say how much the network project will cost or how much money it will save the car rental firm.

The network will support Hertz's car reservation, marketing and financial activities, said Gary Orrell, staff vice-president of MIS at Hertz.

"This network allows Hertz to protect its investment in multivendor systems and to further deploy those systems while maintaining a very cost-effective network solution," Orrell said.

The AT&T contract not only covers the sale of data communications equipment, but includes services too. It is a multimillion-dollar agreement, according to sources familiar with the contract who asked not to be named.

Orrell confirmed that the Datakit II switches will route traffic over the backbone to the data center here, thereby eliminating costly low-speed dedicated point-to-point links from remote offices to the network center.

Hertz will link its remote locations to the regional Datakit II nodes via low- to medium-speed dedicated lines in the 9.6K to 56K bit/sec range, Orrell said.

The Datakit II nodes will be tied to the network center here via a high-speed backbone comprising 56K bit/sec and T-1 links that support data and some voice traffic. The network center also employs a Datakit II node, which passes data to any of several mainframes from IBM, Unisys Corp. and others, Orrell said.

Datakit II, which became generally available in June, replaces the earlier Datakit I version of the product that the Park Ridge, N.J.-based car rental company had started to implement as regional nodes. Datakit II is an advanced packet switch capable of transporting large amounts of data over widely dispersed data nets supporting multiple protocols and vendors' equipment.

Under the net overhaul, remote car rental offices will be equipped with AT&T's eight- to 16-port Synchronous/Asynchronous Multiplexers, which allow them to communicate with the regional Datakit II nodes and access multiple network applications, sources said.

(continued on page 26)

DEC admits to delays in DECprint strategy

Vendor says staff, technical issues holding up delivery of blueprint to share printers on DECnet.

By Jim Brown
Senior Editor

MAYNARD, Mass. — Digital Equipment Corp. last week said it will miss a promised deadline next month for publishing its DECprint architecture, a previously announced strategy to define how disparate systems on a DECnet or TCP/IP net can share network-attached printers.

DEC announced its DECprint architecture last July and was to publish the full blueprint next month. But some technical details that are still not completed and unspecified staffing changes on the DECprint project team are forcing DEC to miss its deadline.

Len Winmill, DEC's hardcopy marketing consultant, said DEC will publish the document as soon as possible, but he declined to offer a release date.

DECprint will enable users of DEC and non-DEC systems to issue native system commands to print a document or image on a printer attached to DECnet or Transmission Control Protocol/Internet Protocol nets.

DECprint will enable network users to support DECprint-compliant printers spread across the network, instead of relying on an array of printers, each linked to a particular system processor.

The DECprint architecture is similar to DEC's plan to release software that enables disparate systems on DECnet or TCP/IP nets to transparently communicate and share data.

"Just as people need seamlessness and interconnectivity among disparate systems, they need it for printing too," Winmill said.

The pending DECprint specifications will enable software developers to build DECprint-compliant software that converts a system's proprietary printer commands to DEC printer commands.

It will also help other printer vendors make their products DECprint-compliant.

Eastman Kodak Co. has already agreed to work with DEC to make its Ektaprint 1392 high-speed laser printer DECprint-compliant. Winmill said DEC is trying to reach similar agreements with Xerox Corp. and Sie-

(continued on page 26)

> "Just as users need interconnectivity among disparate systems, they need it for printing too."

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Gazelle chipset makes 1G bit/sec links possible

By Jim Brown
Senior Editor

SANTA CLARA, Calif. — Gazelle Microcircuits, Inc. recently unveiled a chipset that can help computer manufacturers build communications boards supporting synchronous data transfer speeds of up to 1G bit/sec.

The chipset, dubbed Hot Rod, initially will be used to build communications coprocessor boards that support a point-to-point link between computers or that go between a computer and a peripheral, such as a disk drive.

Eventually, the chipset could be used to build interface boards that link computers to local-area networks operating at speeds far above the emerging 100M bit/sec Fiber Distributed Data Interface.

Hot Rod can achieve these high speeds because it is made out of gallium arsenide, a compound similar to the silicon used to make most computer chips. The combination of the gallium arsenide and the Hot Rod chip design enable electrons to move five times faster in Hot Rod chipsets than they can through comparable silicon-based chips, said Jonathan Zierk, Gazelle's product marketing engineer.

Initially, Zierk said, Hot Rod will be used in communications coprocessor boards, which offload the communications tasks from the host's CPU and transmit data in a point-to-point fashion to another computer or an attached peripheral. The boards will not, however, provide an interface to existing networks.

(continued on page 26)

OPEN VS.

SUN

No commercial-grade file system

No system under $700/MIPS

No POSIX compliance

No symmetric multiprocessing

DEC

No open I/O bus across product line

No symmetric multiprocessing currently available

No multi-vendor binary compatibility

No system under $700/MIPS

IBM

No open architecture

No multi-vendor binary compatibility

No POSIX compliance

No system under $2500/MIPS

No symmetric multiprocessing

The above comparative product data is based on industry newsletters, industry analyst information, vendor price lists, vendor advertising material, and other material available as of September 7, 1989. For a listing of information sources, please write Advertising, M.S. 9/S, Data General Corporation, 3400 Computer Drive, Westboro, MA 01580.

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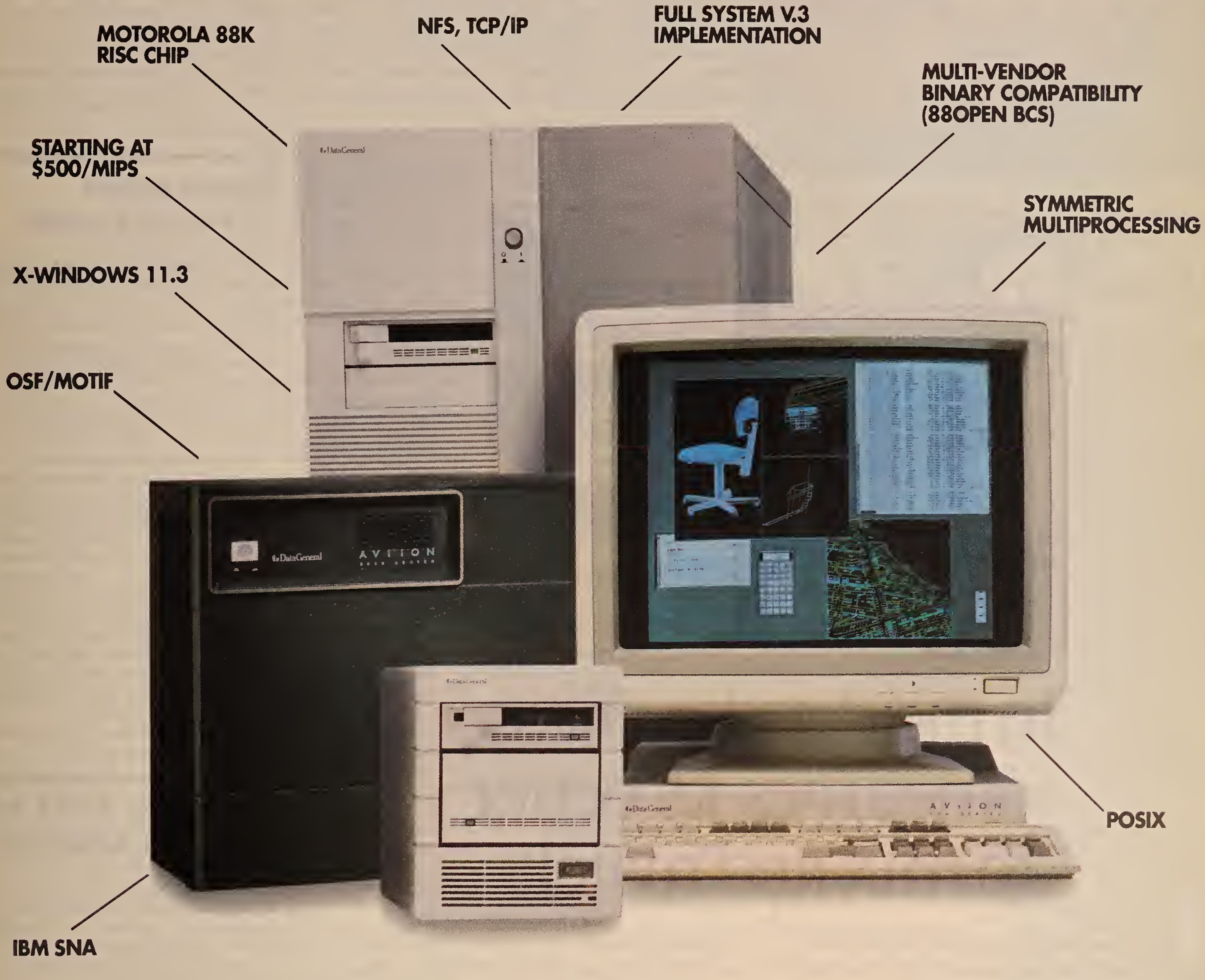

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DEC admits to delays in DECprint strategy

continued from page 23

mens Information Systems, Inc.

The main component of DECprint will be a Printer Access Protocol (PAP). The PAP is software that will run on a VMS- or Ultrix-based VAX and define how print jobs, created by disparate systems, must be converted to DEC commands before being printed on DECprint-compliant printers. It also will specify how the VAX will be used to pass print commands and print job status messages between the end-user device and the printer.

DEC has developed a version of PAP software that is supported by DEC's PrintServer 40, PrinterServer 40+ and PrintServer 20 printers, but not yet on its other printer lines. "The reason the protocol is private today is because we are not confident enough to nail it to the ground, which is what will happen when we publish it," Winmill said.

This early version of PAP software, called PrintServer, comes bundled with the PrintServer printers. PrintServer printers attach directly to a DECnet- or TCP/IP-based Ethernet.

PrintServer software consists of PrintServer Client and Support Host packages running on a VMS- or Ultrix-based VAX. Together, the packages enable the VAX to control the operation of the PrintServer printers. PrintServer Client accepts print requests from terminal users that are attached to the same VAX running the PrintServer Client software or to another VAX or Ultrix system on the network.

PrintServer Client software routes the print job to the network printer that the end user has specified. Future versions of PrintServer Client will automatically scout the network for the printer that is best suited for the job, then download the task to that printer.

The Support Host software also runs on a VMS- or Ultrix-based system and enables users to download printer operating software to PrintServer printers. This approach will enable users to download new versions of printer operating software to the PrintServer.

PrinterServer Client software also works with DEC's VMS Services for PCs — which until recently was called VAX/VMS Services for DOS — running on a VMS-based server. VMS Services for PCs enables DOS-based microcomputers running DEC's DECnet Personal Computing Systems Architecture (PCSA) Client for DOS software to attach to DECnet networks. A version of VMS Services for PCs and DECnet PCSA Client supporting OS/2-based microcomputers will be introduced next spring.

With VMS Services for PCs, microcomputer users can issue DOS or OS/2 print commands to print a document on a DEC printer. VMS Services for PCs will convert those commands to DEC formats and pass them to the VAX running PrintServer Client software. Previously, those commands were sent to a DECnet-attached printer.

Apple Computer, Inc. Macintosh users linked to a VAX running Alisa Systems, Inc.'s AlisaShare or Pacer Software, Inc.'s PacerShare Macintosh-to-DECnet gateway software can likewise issue Macintosh commands, which are converted and routed to the VAX running PrintServer Client software. ◼

Chipset makes 1G boards possible

continued from page 23

The first board-level products that use Hot Rod, which consists of two chips, will support 1G bit/sec point-to-point links over coaxial cable for distances up to 100 feet and up to several kilometers over fiber-optic cable. The chipset can also support speeds of 500M bit/sec, 250M bit/sec or 125M bit/sec over the same distances. Zierk said he expects products that use Hot Rod to hit the market by mid-1990.

Zierk said a prime use for Hot Rod is to link graphics terminals on a factory floor to a host CPU. These terminals are often used in real-time quality control applications in which an engineer can recall a blueprint to ensure that a product coming off the production line meets specifications. "To keep refreshing a high-resolution graphics screen, you need to send data at rates of 800M bit/sec and 1G bit/sec," Zierk said. With Hot Rod, that screen can be refreshed within a second, whereas it would take several seconds with existing communications setups.

Hot Rod chipsets cost $370 each when bought in quantities of 100. ◼

Hertz picks AT&T to build data backbone

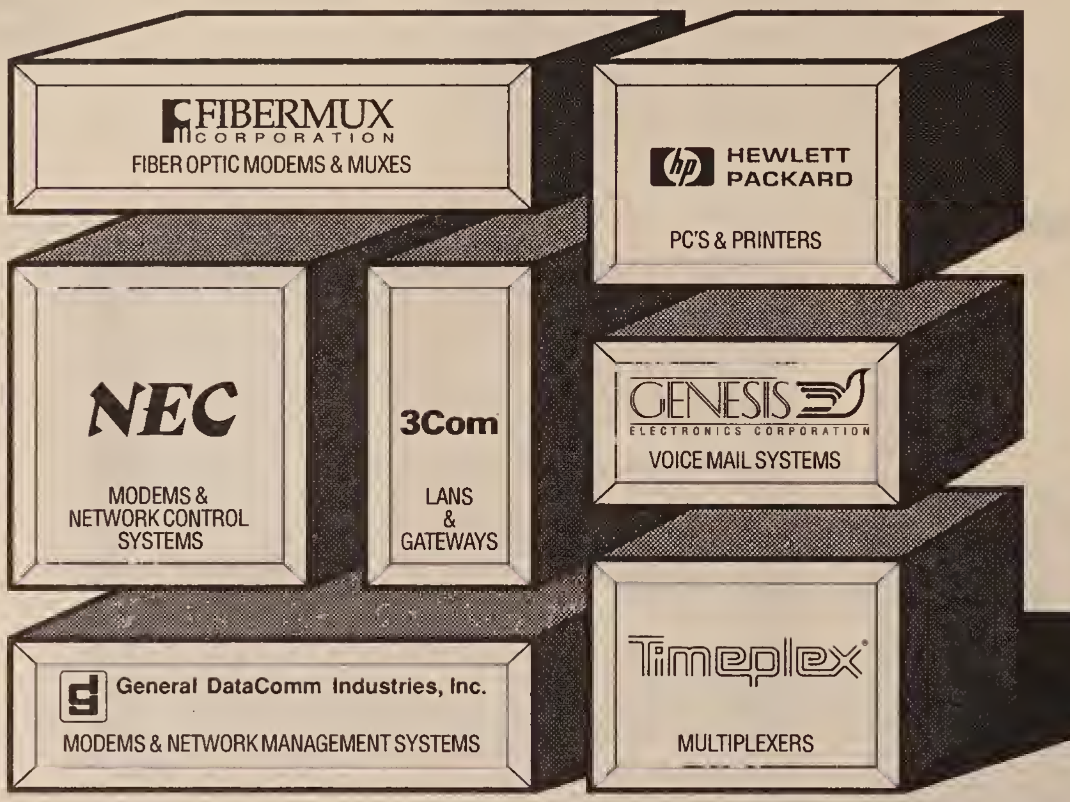
continued from page 23

The network supports a variety of traffic from the remote sites, including asynchronous and synchronous IBM Systems Network Architecture traffic to hosts at the net center here. Among other remote-site applications, the Datakit II network supports the Hertz Advanced System Architectural Plan/As Soon As Possible (ASAP) reservation counter automated point-of-sale system.

Hertz will manage the Datakit II devices using AT&T's StarKeeper Network Management System software, which runs on an AT&T Accumaster Consolidated Workstation. StarKeeper and the Accumaster workstation are components of AT&T's Unified Network Management Architecture.

"The StarKeeper brings a lot to the table," Orrell said. "It allows us to tie together and more effectively manage our network." The StarKeeper product enables Hertz, for example, to reroute a downed circuit via an alternate path, he said.

The Datakit rollout is expected to be completed by year end, Orrell said. ◼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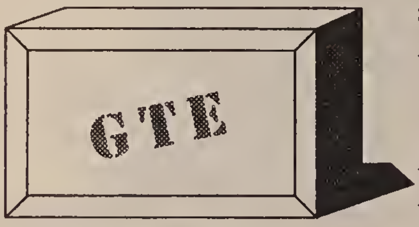

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> **Dave Vellante**
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> Storage Research
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> Framingham, Mass.

Netnotes

Novell, Inc.'s eight-user version of NetWare will soon have a high-performance mass storage option, thanks to a licensing agreement announced earlier this month between the net vendor and **Plus Development Corp.** of Milpitas, Calif.

Plus Development has introduced a new ELS NetWare II Conversion Kit for installing the Plus Impulse disk subsystem on servers running Novell's ELS NetWare Level II 2.15. The kit includes drivers licensed from Novell and represents the first time Novell has licensed only a piece of NetWare to an OEM.

The kit consists of seven diskettes that are used in place of the installation diskettes that come with ELS NetWare II and obviate the need to run Novell's lengthy Compsurf program.

The kit can be used to install up to eight 80M-byte Plus Impulse drives in a cluster accessed via Plus' multichannel Cluster Disk Interface. One disk interface card can handle two internal drives and up to six external drives.

According to Plus, this interface and a 64K-byte cache enable the subsystem to achieve an effective average access time of 12 msecs and a throughput of 800K byte/sec.

The kit will be available Dec. 2 for $100.

For more information, contact Plus Development at 1778 McCarthy Blvd., Milpitas, Calif. 95035, or call (408) 434-6900.

Gateway gives high-speed access to packet networks

G/X25 supports digital links at up to 64K bit/sec.

By Laura DiDio
Senior Editor

LAS VEGAS — Gateway Communications, Inc. last week introduced at the Comdex/Fall '89 show here an X.25 gateway that enables local-area network users to access X.25 networks over digital facilities at speeds up to 64K bit/sec.

The G/X25 Gateway 64 — a hardware and software package for IBM Personal Computer XTs, ATs and Personal System/2 Model 30s or compatibles — enables LAN users to access remote hosts using digital data circuits ranging in speed from 9.6K bit/sec to a maximum 64K bit/sec, said Bert Ott, Gateway's vice-president of sales.

The new gateway's X.25 communications software uses Gateway's Interactive Personal Computer (IPC) interface to perform the X.3 packet assembler/disassembler functions for call routing and session management.

The G/X25 can be used on IBM Network Basic I/O System compatible LANs, including OS/2 LAN Manager, Novell, Inc.'s NetWare and 3Com Corp.'s 3+Share and 3+Open.

The G/X25 supports as many as 254 sessions, and each LAN node can support a maximum of four simultaneous terminal-emulation sessions, Ott said.

Besides the 64K bit/sec speed offered by the gateway, the device cuts down on the number of bad data packets transmitted. "The G/X25 Gateway 64 features guaranteed delivery of all data packets with less than one undetected error for every 100 data bits transmitted," Ott said.

Patrick Weithers, director of computer services/MIS at Black Entertainment Television (BET), a cable TV network in Washington, D.C., agreed. BET has beta-

(continued on page 28)

Tools adapt LAN Manager for dual-processor servers

By Susan Breidenbach
West Coast Bureau Chief

MOUNTAIN VIEW, Calif. — Parallan Computer, Inc. has developed software and hardware that will help OEMs of Microsoft Corp.'s OS/2 LAN Manager build versions of the local-area network operating system for servers with two processors.

Version 2.0 of LAN Manager, introduced earlier this month, will run on a server with an Intel Corp. 80286 or 80386 processor. However, the operating system can also be split up and run across two 80386 processors.

For example, the file system can be installed on a main central processor, and the rest of the operating system can be implemented on a secondary processor. Similarly, the entire operating system can be running on the primary processor while a second processor is used as an OS/2 application server running a program such as the Microsoft/Ashton-Tate Corp. SQL Server data base engine.

Compaq Computer Corp., which earlier this month introduced a version of LAN Manager 2.0 that supports two processors, did its own development work on the operating system. However, Parallan is offering the necessary software and coprocessor technology to OEMs that do not have Compaq's resources.

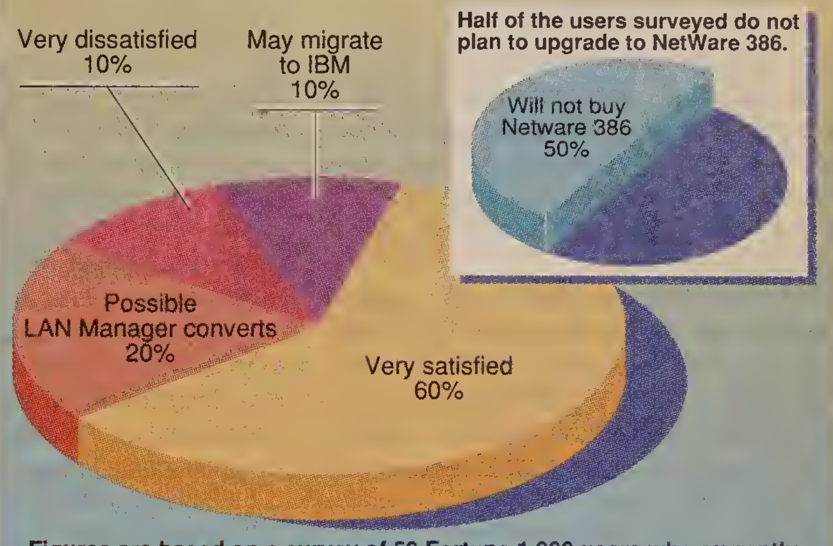
The Parallan software is available in two configurations: one for a file server environment and one for an application server. LAN Manager OEMs can also purchase Parallan's coprocessor board, which includes an Intel 80386 processor and 4M to 8M bytes of random-access memory, or they can license the technology to use as a template for their own boards.

The file server configuration puts the file system on the main processor and the OS/2 logic and network protocols on the other processor. In the application server version, the network protocols are on the primary processor with the file system, leaving the second processor to handle only applications, maximizing application throughput.

Whether a server has one or two central processors is transparent to LAN Manager applications; they merely run faster in the two-processor configuration.

The hardware and software are available from Parallan now. The board supports the industry-standard architecture defined by the original IBM Personal Computer XT and AT line, although Parallan said it is working on Micro Channel architecture and Extended Industry Standard Architecture versions.

NetWare: the end of a love affair?



Figures are based on a survey of 50 Fortune 1,000 users who currently have NetWare.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: FORRESTER RESEARCH, INC., CAMBRIDGE, MASS.

LAN Manager specter rises before Novell

Version 2.0 addresses previous shortcomings and promises serious competition to NetWare.

By Laura DiDio
Senior Editor

CAMBRIDGE, Mass. — Although Novell, Inc.'s NetWare is firmly entrenched as the No. 1 local-area network operating system with about 60% market share, its continuing success is by no means assured, according to financial and market research analysts.

Several converging factors threaten Novell's dominance, analysts say, the most ominous of which is the imminent release of LAN Manager Version 2.0 by about 36 OEMs.

LAN Manager 2.0, scheduled to ship in the first quarter of next year, is functionally more robust than the initial 1.0 implementation and promises to give NetWare the first serious competition in its six-year domination of the LAN network operating system market.

> LAN Manager 2.0 addresses all of the weaknesses of the earlier version.
>
> ▲▲▲

"LAN Manager 2.0 will be a much stronger competitor to Novell's NetWare than any system Novell has ever faced," said Mary Henry, an analyst at Goldman, Sachs & Co., a New York-based investment firm.

Henry and other analysts said they believe LAN Manager 2.0 addresses all of the weaknesses of the earlier version, including excessive system memory consumption and weak security features. LAN Manager 2.0, analysts say, goes beyond current requirements by providing a client/server architecture for the future.

By contrast, Henry noted, Novell's NetWare is primarily for file and print sharing. With the network industry moving toward distributed client/server applications, Novell's approach now appears somewhat simplistic, Henry said.

"By most measures of performance and functionality, we think that the performance gap that once existed between Novell and Microsoft [Corp.] has disappeared," Henry said.

"The perception is that LAN Manager is *the* standard, since every major computer company — including the most recent convert, Compaq [Computer Corp.] — has licensed it," she said. "Compatible products will evolve for a long time on all the major hardware platforms, including MS-DOS, OS/2 and Unix," Henry said.

LAN Manager gained more momentum last week at the Comdex/Fall '89 show in Las Vegas when IBM and Microsoft announced they would merge the Microsoft/3Com Corp.-developed LAN Manager with IBM's LAN Server. The effort will ensure that all of the application program interfaces used with the LAN operating systems will be identical.

The IBM/Microsoft announcement came on the heels of Compaq's announcement a week earlier that it too had joined the ranks of the LAN Manager OEMs.

(continued on page 28)

Gateway gives speedy access to packet nets

continued from page 27

tested the X/25 Gateway 64 for the past two months on its IBM 4M and 16/4M bit/sec Token-Ring LANs.

"The X/25 Gateway 64 gives us [a] 93% errorfree data transmission rate since it uses digital data signals, which are much less prone to errors than analog signals," Weithers said. "Prior to this, we had a data retransmission rate of 17% with our 9.6K bit/sec gateways, which utilized analog transmission facilities."

The single connection to the packet-switched network will enable LAN workstation users to access multiple devices, which reduces the requirement for multiple dedicated lines and modems for connections to remote hosts.

Weithers said that the G/X25 enabled the cable TV station to cut costs and raise LAN users' efficiency.

Although BET's 9.6K bit/sec gateways offered sufficient data transfer speeds for routine file transfers and electronic mail messaging among its 70 network users, Weithers said the response time was inadequate for users in the station's finance department, which is in remote offices.

Five members of BET's finance department depend on the gateway for simultaneous interactive access to integrated accounting applications on an Intel Corp. 80386-based server at BET headquarters.

"When we used the 9.6K bit/sec gateways to try to establish simultaneous interactive accounting sessions, it took the average employee an entire day to complete the transmission of general ledger entries into BET's data base. The same task using the X/25 Gateway 64 takes just two hours," Weithers said. "That adds up to about $200 per day [in] savings for each of our five finance department employees [because of] reduction of manpower hours spent on a specific task."

The G/X25 Gateway 64 consists of a wide-area network interface adapter with an on-board Intel 80186 CPU and firmware that performs the high-speed, multitasking processing. The intelligent hardware resident in the gateway's adapter allows the personal computer host or server to remain nondedicated, thus leaving the system free for use as a network workstation.

The G/X25 Gateway 64 is available now and costs $3,445. ◘

LAN Manager specter rises before Novell

continued from page 27

The message these two developments send to users is clear: Despite a rocky start, LAN Manager will be a de facto standard with staying power and will clearly eat into NetWare's market share.

As if the renewed threat of LAN Manager were not enough for Novell to deal with, a recent survey by Forrester Research, Inc. in Cambridge, Mass., of 50 current Fortune 1,000 Novell users indicated unhappy with NetWare in a number of key areas. Titled "High Noon in Provo," the survey showed users were dissatisfied with NetWare's lack of OS/2 support, unsophisticated wide-area networking (WAN), poor service and the high cost of NetWare 386, which is 30% to 50% more expensive than rival products.

Additionally, 50% of the users surveyed by Forrester said they will not buy NetWare 386, according to Mary Modahl, the analyst who prepared the report.

"Users are frankly shocked by the $8,000 price tag of NetWare 386. Most users expect to pay in the $3,000 to $5,000 range for network operating systems, and many of the users we spoke with said they won't buy [NetWare 386] unless the price drops," Modahl said.

Based on user reactions, Modahl predicts that Novell will be compelled to cut the price of NetWare 386 in the first quarter of 1990. "Novell is going to have to prime the pump to get NetWare 386 sales flowing," Modahl said.

Bright spots

The news is not all bad for Novell though. According to the Forrester study, 60% of the Novell users polled are convinced NetWare is the best LAN choice. And Raymond Noorda, Novell president and chief executive officer, recently told *Network World* that NetWare is gaining about 400,000 new users every quarter.

Still, if Novell is to continue increasing its installed base, it will have to address key user concerns, according to Forrester's Modahl. Forty percent of the users surveyed said they are reviewing their commitment to NetWare. Within that figure, 10% of the users expressed severe dissatisfaction, citing shoddy service as the chief problem.

Ironically, it is the burgeoning success of NetWare that has created "a service nightmare" for Novell, says Doug Gold, manager of communications industry research at International Data Corp. in Framingham, Mass. "For a company that only has about 2,000 employees and plans to lay off about 20% of its work force during 1989, the task of supporting 50% of the worldwide installed base of LANs may prove overwhelming," Gold said.

Modahl's study also showed that another 20% of NetWare users are considering migrating to LAN Manager because they want OS/2 applications and WAN communications capabilities. The remaining 10% said they might migrate to IBM.

"Novell has no choice," Modahl said. "They must position NetWare 386 clearly vis-a-vis OS/2 and offer better wide-area services or face additional defections."

Better positioning or not, Henry says the defections are inevitable.

"Although Novell currently has the dominant market share and boasts many loyal users, the erosion of that market share is inevitable, and we're suggesting to clients that they avoid buying Novell stock," Henry said. ◘

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MANAGEMENT STRATEGIES

MANAGING PEOPLE AND TECHNOLOGY: USERS GROUPS AND ASSOCIATIONS

Worth Noting

"One reason many companies are outsourcing their data processing or network operations is because they can't provide technical specialists with adequate career paths within their organization."

Kenneth Hoyt
Consultant
Arthur D. Little, Inc.
Cambridge, Mass.

Association Watch

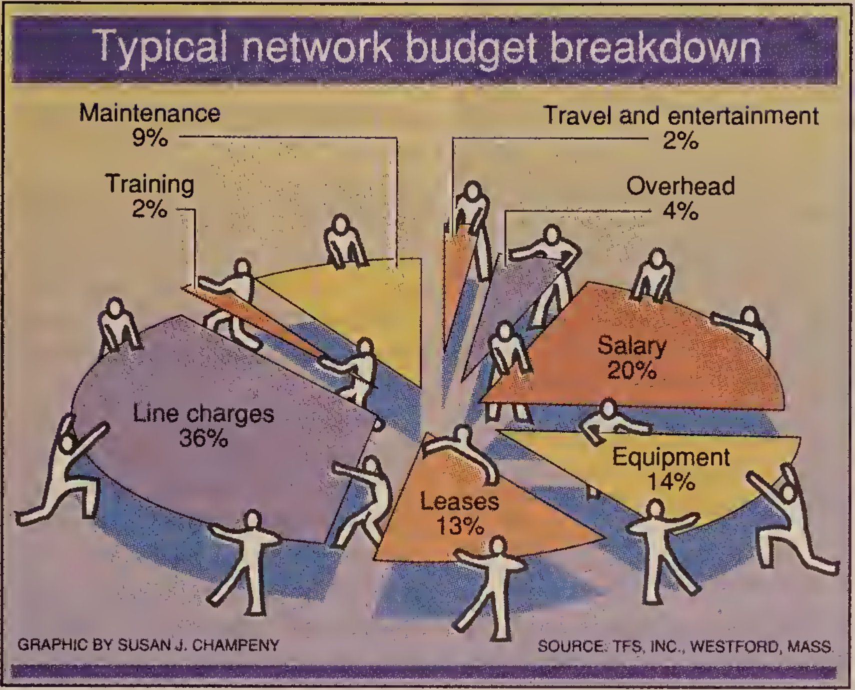
The **National Automated Clearing House Association (NACHA)** recently announced that its multimillion-dollar campaign to encourage electronic deposits of paychecks helped register 380,000 employees in direct deposit programs nationwide from April through September of this year. The number of new enrollees was more than double that of projected figures, according to NACHA officials. The enrollment boost is expected to save U.S. banks more than $2.9 million a year.

The **Transportation Data Coordinating Committee: Electronic Data Interchange Association (TDCC:EDIA)** will hold its 21st National EDI Systems Conference and Exhibit Dec. 12 to 14 in Washington, D.C. The conference, which is expected to draw about 2,400 people, will feature more than 120 vendor exhibits, 43 seminars and four half-day, pre-conference tutorials.

James Barksdale, chief operating officer of Federal Express Corp., will give the keynote address, titled "EDI: Making it Work, Making it Productive, Making it Profitable."

Attendance at the conference costs $395 for TDCC: EDIA members and $450 for nonmembers; members can attend the tutorials for $195, while nonmembers must pay $225. To register, call TDCC: EDIA at (703) 838-8042. ◾

Typical network budget breakdown



GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: TFS, INC., WESTFORD, MASS.

Network to link doctors to hospital, labs, drug stores

Net will reduce red tape and save doctors time.

By Wayne Eckerson
Staff Writer

KNOXVILLE, Tenn. — In an effort to trim costs and reduce paperwork, Park West Medical Center here is building a network that lets affiliated physicians use microcomputers to dial into the hospital, as well as reference libraries, laboratories, insurance companies and pharmacies.

The network enables physicians to schedule patient visits to Park West and receive test results quickly. It also helps Park West make more efficient use of its clinical and clerical staff and equipment.

"We are trying to give physicians a maximum amount of information in a minimum amount of time," said Jim Morris, assistant administrator at Park West, which is owned and managed by the Hospital Corp. of America in Nashville.

Morris said the network will create a bond between physicians and Park West by making it easier for the physicians to do business there.

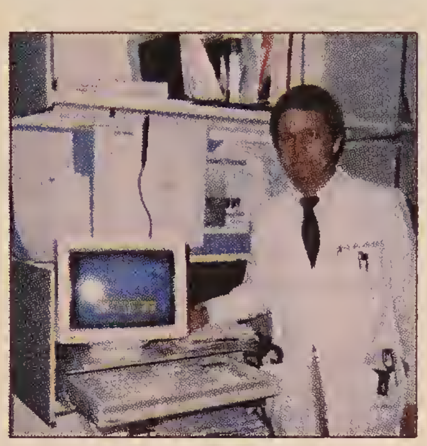
The network will reduce bureaucratic hassles and save physicians time when scheduling appointments, filing insurance claims, receiving test results and consulting with other physicians.

As a result, doctors will be more apt to admit patients to Park West, Morris said. This will boost the hospital's bottom line and give it a competitive advantage over nearby hospitals.

"One of the reasons health care is so expensive is that we [physicians] are buried under paperwork," said Dr. Charles Barnett, a practicing physician at Park West.

While many hospitals are building links to affiliated physicians, few are linking physicians together or to other outside groups, such as insurers, said George Kennedy, president of The Kennedy Group, a health care technology consulting firm in Redwood City, Calif. The Park West network is actually a beta-test product from Med Data Plus, Inc., a medical software company here founded by Barnett.

Med Data Plus, in conjunction with AT&T, is providing participating physicians with AT&T personal computers outfitted with modems and communications software. The communications software enables physicians to autodial participating pharmacies, insurers and other health care groups that are part of the network. These groups also have been equipped with Med Data Plus software and any communications equipment they needed.



Dr. Charles Barnett

In addition, Med Data Plus equipped Park West with an AT&T 3B2 minicomputer to process incoming physician calls and to run scheduling software from IntelliMed Corp. of Nogura Hills, Calif.

IntelliMed's software keeps track of how much time each physician needs to complete specific medical procedures and schedules appointments accordingly.

(continued on page 30)

British exchange's futures net a first

New futures trading network will extend the exchange's operating hours, woo Chicago traders.

By Barton Crockett
Senior Editor

LONDON — Next week, the London International Financial Futures Exchange (LIFFE) plans to become the first exchange in the world to cut over a network that supports the electronic trading of futures.

The so-called Automated Pit Trading (APT) system, scheduled to start operation Nov. 30, will be the first of three futures trading networks expected to come on-line in the next two years. The others, the Chicago Mercantile Exchange's Globex net and the Chicago Board of Trade's Aurora network, are slated to go live in 1990, although the cutover of Aurora may be delayed by ongoing negotiations to merge the net with Globex.

LIFFE considers APT critical to its survival in the 1990s. APT will be used to extend LIFFE's regular trading day by a few hours, helping LIFFE lure traders from other time zones. This is considered necessary to compete with the Chicago exchanges, which are expected to use their own after-hours trading networks to woo LIFFE traders.

"We need APT in order to assure continued liquidity," said LIFFE's director of technical services, Roger Barton.

> "We need APT in order to assure continued liquidity," said LIFFE's Barton.
>
> ▲▲▲

APT also represents a high-profile extension of a three-year initiative by the British exchange to use information networks for competitive advantage. The multimillion-dollar effort, dubbed LIFFEforce, includes plans to revamp LIFFE's trade matching systems, to expand the capabilities

(continued on page 30)

EXECUTIVE BRIEFS

BY WAYNE ECKERSON

Do you fit the CIO bill? If you're a 43-year-old, white, Protestant male married to your first spouse, hold an advanced degree, work 54 hours a week and make $71,320, there's a good chance you're a chief information officer (CIO) in the health care industry. That's according to a recent survey of 100 health care CIOs by Heidrick and Struggles, Inc., an executive search firm in Chicago, and the Healthcare Information and Management Systems Society (HIMSS), a Chicago-based association of information systems managers.

The typical health care CIO oversees an annual budget of $3.8 million and has logged seven years in the same organization and four years in his or her current position. More than 80% of the respondents said their primary role is to determine information technology strategy, particularly integrating information systems and telecommunications.

Not surprisingly, most respondents don't hold the title of CIO. A majority of those surveyed (51%) are vice-presidents, 18% are directors and just 7% are officially CIOs.

Nearly 40% of the executives surveyed report to the chief operating officer, 17% report to a chief financial officer and 12% report to a senior vice-president. Just one-third (34%) report directly to the chief executive officer.

Ready or not, 1992 is coming. A surprising number of U.S. companies aren't ready to compete in post-1992 Europe, according to a recent survey of 350 chief executive officers by The Conference Board, a business research group in New York.

Forty-five percent of executives surveyed said their firms have an insufficient presence in Europe to compete effectively

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British futures net a first

continued from page 29

of its price reporting networks and to become the first exchange in the world to offer trading firms an on-line, real-time account of their trading position.

Crown jewel

But the crown jewel of LIFFEforce is APT. For a monthly charge of approximately $1,200 and a onetime installation fee of about $2,100, LIFFE will give APT users a Sun Microsystems, Inc. workstation and a dedicated 64K bit/sec link to two Sun host workstations at the exchange running APT trading software. These host workstations will be configured to back each other up in case of failure.

Traders will use the workstations, which sport a graphical user interface that mimics an open outcry trading pit, to buy and sell futures and options.

Initially, trading on APT will run from 4:30 p.m. to 6 p.m. London time and be limited to only one financial instrument. Next year, a 7 a.m. to 8 a.m. session will be added, and LIFFE plans to support all of its financial instruments on APT. Some of these instruments include contracts traded both at LIFFE and the Chicago exchanges, such as futures on U.S. Treasury bonds.

Barton said that eventually APT's operational hours could be extended to run throughout the regular trading day.

Barton said LIFFE spent about $2.5 million to develop the software and purchase the host Sun workstations that support APT.

LIFFE invests in IS

System	Description	Implementation date
Trade Registration System (TRS)	Real-time trade recording and matching.	Sept. 87 - Dec. 88
Trade Registration Application Message Protocol	Common application interface for TRS.	June 88
Clearing Processing System	Real-time updates of a firm's trading position.	Sept. 89 - March 90
Automated Pit Trading (APT)	After-hours futures and options trading network.	Nov. 89 - June 90
LIFFELink	Common interface that price quote vendors can use to route buy and sell orders to the APT network.	Dec. 89

Major components of LIFFEforce, a multiyear IS initiative by the London International Financial Futures Exchange.

SOURCE: LIFFE, LONDON
GRAPHIC BY SUSAN J. CHAMPENY

Next year, LIFFE plans to let traders use New York-based Telerate, Inc.'s international networks, which distribute price quotes for stocks, futures and options, to route buy and sell orders to APT.

Barton said negotiations are under way for similar arrangements with other price quote vendors and international network service providers, such as GE Information Services.

"Clearly, we're not in the business of building global nets," Barton said. "We'll strike arrangements with these other vendors to make sure our reach can extend throughout the world."

Other initiatives

APT will complement other LIFFEforce initiatives. Among these is LIFFE's recently completed Trade Registration System (TRS). Under TRS, which was installed last year, records of trades are entered as soon as they are completed into terminals at the exchange or in a trading firm's offices.

The records are then routed to the exchange's Digital Equipment Corp. minicomputers via local Ethernet links or dedicated 9.6K bit/sec transmission facilities. The minicomputers match a buyer's entry with the seller's. Discrepancies are kicked back to one of four terminals near the trading floor.

Traders resolve problems as they are uncovered. Previously, the process of resolving trading discrepancies took one or more days, as traders had to wait overnight for the exchange to run its trade-matching applications.

Barton said the ability to resolve discrepancies faster will let trading firms keep closer tabs on their trading accounts.

This year, LIFFE also plans to finish upgrading the capacity of its Price Reporting System (PRS). The PRS is used to distribute real-time quotes of prices on LIFFE trading floors to price quote vendors, such as Telerate. Price quote vendors get this information through dedicated network links to LIFFE's host computers.

Previously, LIFFE's PRS could handle only five price changes per second. Now, using the two new VAX 8820s and upgraded software, PRS can handle up to 20 price changes per second, Barton said.

In addition, by March of next year, LIFFE plans to finish deploying its Clearing Processing System, which trading firms can use to get real-time statements about their outstanding debts and uncollected revenues. Barton said that no other exchange offers this kind of information in real time.

Trading firms can retrieve this information using the same dumb terminal they use for TRS.

Barton said the LIFFEforce initiatives were needed in part to accommodate massive growth at the exchange. Trading volume has increased more than 75% annually since LIFFE was founded seven years ago, and the exchange's original information systems simply couldn't keep up, he said.

He added, however, that LIFFEforce is intended to give the exchange a competitive advantage. "Information systems are becoming critical to maintaining a leadership role in the trading markets," Barton said. "LIFFEforce will give us tremendous capabilities in this area." ◼

Net to link doctors to hospital

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This helps reduce underbooking or overbooking and enables the hospital to use facilities and personnel as efficiently as possible.

Multiple links

Currently, 14 physician offices are connected to Park West. The offices are also linked via dial-up lines to eight pharmacies in the area, a home health care agency and major insurers, including Medicaid, Medicare and Blue Cross-Blue Shield of Tennessee.

The dial-up links to the pharmacies enable physicians to send a prescription to a pharmacy so it is ready by the time the patient arrives. The network also enables physicians to transmit insurance claims electronically to insurers, reducing paperwork and speeding reimbursement.

In addition, the network allows physicians to share information among themselves or with laboratory specialists. Physicians can send patient records to another physician for a second opinion or to a specialist who can review the records before the patient arrives. Dial-up links to Park West's laboratory enable physicians to receive patient test results when they are ready, instead of waiting for them to be delivered by mail.

The network also enables physicians to access up-to-date information on drugs, treatments and diagnoses from an extensive medical library stored on CD-ROM disks at Park West.

Morris said Park West will expand the network next year to include 83 physicians, as well as an external laboratory. In addition, Park West is planning ways to integrate the network into the hospital's central computer system so physicians can have direct access to complete patient medical records. ◼

Executive Briefs

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once trade barriers begin tumbling in 1992. Only 38% of those surveyed said their firms were ready to compete in a unified Europe.

To play catch-up, most executives are pursuing several strategies. Almost 40% said they plan to expand their existing operations in Europe prior to 1992. Other strategies cited include: increasing exports (30%), mergers and acquisitions (30%), establishing new operations abroad (22%), joint ventures (22%) and licensing products or services (13%).

The sea of acronyms. The high-tech world is notorious for its abundant use of acronyms. And one of the industry sectors that generates more than its fair share of acronyms is the network standards-setting groups, especially those that set standards for electronic data interchange.

Take a gander at some of the more commonly used EDI acronyms: TDCC, UCS, X12, WINS, AIAG, CIDX, UICS, CTX, CTP, BAI and IGES. Confused yet? Well, how about: EDIFACT, TRADACOMs, TDI, ODETTE, SENDEN, TEDIS, CALS, CCD+?

Fortunately, a comprehensive guide has been prepared that helps users sort through this morass. It's called the *EDI Standards Reference Guide,* a 100-page reference to commonly used EDI standards.

Put together by Input, a Mountain View, Calif.-based market research and consulting firm, the guide outlines company- and industry-specific de facto standards, as well as standards issued by the ANSI X12 committee. It also evaluates a host of international standards and includes a discussion of the pros and cons of EDI for Administration, Commerce and Transport. The guide also details emerging EDI standards for electronic funds transfer and graphics.

The *EDI Standards Reference Guide* can be purchased for $500 by writing to Input, 1280 Villa St., Mountain View, Calif. 94041, or by calling the firm at (415) 961-3300. ◼

To get information on products or services
advertised in this week's issue
of *Network World*,
see the FAXNeT Form on Page 45

FAXNeT

PRODUCTS & SERVICES

THE LATEST OFFERINGS FROM VENDORS AND CARRIERS

Worth Noting

See inside for:

- Wang software that lets Wang VS minis access Unisys A and V Series mainframes.
- Equinox's 12-port board that ties async terminals to PCs running Unix or Xenix.

First Look

Hayes unveils modem for Apple Mac IIs

Hayes Microcomputer Products, Inc. last week introduced at Comdex/Fall '89 an internal 2,400 bit/sec modem for Apple Computer, Inc. Macintosh II microcomputers.

The **V-Series Smartmodem 2400M** supports V.42bis for data compression at a 4-to-1 ratio, which will allow it to communicate at 9.6K bit/sec.

The V.42 error-correction standard incorporates the Microcom Network Protocol Class 4 and Link Access Procedure M. It also supports X.32 standards for dial-up access to X.25 packet-switched networks.

The V-Series Smartmodem 2400M can also transmit at 1,200 and 300 bit/sec, according to the company.

Two software programs included with the modem — HayesConnect and HayesConnect Server — permit Macintosh II, IIx, IIcx and IIci on an AppleTalk network to share the V-Series Smartmodem 2400M.

The modem, which communicates synchronously and asynchronously, will be available in January for $699.

Hayes Microcomputer Products, Inc., P.O. Box 105203, Atlanta, Ga. 30348; (404) 449-8791.

UDS introduces two V.32 modems

Universal Data Systems (UDS) last week introduced two V.32 modems — one with V.42 error correction and the other with support for V.42bis data compression.

The company also unveiled a V.22bis modem that sup-

(continued on page 34)

Fiber LAN boards bow for ISA, EISA

By Tom Smith
New Products Editor

YONKERS, N.Y. — Codenoll Technology Corp. recently unveiled an aggressively priced, next-generation, fiber Ethernet interface that supports traditional personal computer bus architectures and the new Extended Industry Standard Architecture (EISA).

The company's CodeNet Fiber Optic LAN boards for local-area networks will sell for as low as $595 each for models that support the Industry Standard Architecture (ISA). By pricing the new ISA boards at almost 40% less than other fiber interfaces, Codenoll is hoping to put the cost of installing fiber media on par with that of coaxial or twisted pair.

Codenoll made the announcements in conjunction with Compaq Computer Corp.'s introduction of a line of EISA-based microcomputers ("Compaq enters LAN mart with server line," *NW,* Nov 13). Codenoll unveiled two fiber-optic interfaces that support EISA. Those boards will cost $995 each.

Codenoll also said it would initially offer two models of the CodeNet fiber-optic interface that support the ISA at the heart of IBM's Personal Computer AT, Compaq's DeskPro and other compatibles.

The ISA board comes in two versions: the CodeNet-8330 for connection to passive fiber-optic hubs and the CodeNet-8331 for active fiber-optic hubs.

Passive hubs simply relay optical signals that come from all connected nodes. Active hubs, by contrast, regenerate a signal before distributing it, enabling it to be transmitted at far greater distances. The maximum distance that can be supported between a workstation and hub with the Codenoll passive hub is 800 meters; with a Codenoll active hub, the maximum distance is 4.5 km.

The board plugs into an IBM Personal Computer AT, non-Micro Channel Architecture Personal System/2 or compatible. It

(continued on page 34)

StarGate cluster controller links 8 async terminals

LAS VEGAS — StarGate Technologies, Inc. last week introduced a cluster controller that connects up to eight asynchronous terminals to a thin-wire Ethernet network.

The Ethernet Multi-Host (MH) 800, unveiled at Comdex/Fall '89, is a stand-alone device with eight serial RS-232 ports to connect asynchronous terminals to a thin-wire Ethernet local-area net.

The cluster controller is the second product in the company's MH 800 product line. The previously announced MH 800 connected asynchronous terminals to the cluster controller, which then uploaded the data to a host over a dedicated 1M bit/sec Starlan link.

By contrast, the new controller can upload data to a host over a 10M bit/sec Ethernet connection. Ethernet MH 800, like its predecessor, can use the Telnet virtual terminal protocol to access multiple hosts that support the Advanced Research Projects Agency Network protocols, as well as Transmission Control Protocol/Internet Protocol.

The Ethernet MH 800 can link asynchronous terminals to a variety of hosts, including an IBM Personal Computer AT, Digital Equipment Corp. VAX or a mainframe.

Like StarGate Technologies' MH 800 controller, the new Ethernet MH 800 can connect as many as five hosts to the controller, according to David Wertman, marketing manager for StarGate Technologies.

In the initial release of MH 800, which is intended as an entry-level network terminal controller, only IBM Personal Computer AT and Personal System/2 hosts were supported, Wertman explained.

Any computer designated as a host must also be outfitted with the same adapter card that resides in the controller unit.

The Ethernet MH 800 also comes with built-in network drivers to permit the controller to access popular Ethernet network operating systems.

The controller has two Motorola Corp. 80188 processors — one dedicated to communications with the host and one network processor that lets the controller off-load processing from the host CPU, boosting speed and response time.

The eight terminals can transmit data to the controller at speeds up to 38.4K bit/sec. The terminals could be IBM 3151s, asynchronous serial terminals or IBM Personal Computers running asynchronous emulation software.

(continued on page 34)

Net control system polls LANs, bridges

Racal InterLan offering uses InterLan Bridges to give users central control of remote Ethernet nets.

By Tom Smith
New Products Editor

BOXBOROUGH, Mass. — Racal InterLan recently introduced a network management product that can be used to centrally monitor, configure and manage up to 50 remote Ethernet local-area networks linked by Racal InterLan bridges.

LANcentral consists of software and a controller board, the NI5210-16, for Intel Corp. 80386-based IBM Personal Computers or compatibles running DOS. The system can communicate configuration and management information to the company's InterLan Bridge (IB) 30 and IB 3000 intelligent bridges.

The IB 30 is a low-end Ethernet bridge that can filter 14,000 packets per second and forward 6,000 packets per second, whereas the IB 3000 filters 28,000 packets per second and forwards 14,000, according to Charles Dillon, Racal InterLan's director of network management products.

With LANcentral, which uses a Microsoft Corp. Microsoft Windows graphical user interface, customers can develop a network map with icons that represent each bridge, the LANs they support and the individual nodes on those networks. Users can monitor network components and collect statistics from specific bridges, nodes or Ethernets by selecting from the topological map.

Users can monitor components and collect statistics from bridges, nodes or Ethernets.

▲▲▲

Statistics could include "network rate statistics," such as the number of imported and exported frames, number of broadcast packets, number of IEEE 802.3 Ethernet collisions and number of error packets, Dillon said.

In larger network configurations, performance monitoring features include the ability to chart the top 10 bridges and networks measured by a variety of criteria, such as frames transmitted per second or total errors.

LANcentral updates the bridge statistics every 15 seconds by polling the devices. Users see values change on charts in real time, Dillon said.

A data base maintained on the microcomputer tracks network events or alarms, including everything from a bridge failure to a reboot. Network administrators can review event logs on a periodic basis to gauge performance.

"One thing you can't do with this product today is collect data over time and actually graph the data into a format you like," Dillon said. Future releases of the product will likely include an interface to other vendors' data bases for archiving purposes.

LANcentral updates the bridge statistics every 15 seconds by polling the devices.

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The product also supports the Bridge Management Command Line Interpreter (BriM CLI), which enables users to designate individual bridges on the network as primary or secondary under the Spanning Tree Algorithm. The algorithm enables bridges to learn the network's topology and route data via the most efficient paths, using alternate data paths in the event of failures.

The BriM window is menu-driven, enabling users to select options based on the cost of a given network path, for example.

Dillon said users can display as many net management windows as needed on the microcomputer screen. For example, the screen could have windows displaying the network's topology map, network rate statistics and statistics charting the performance of the top 10 bridges.

As a Microsoft Windows multitasking application, LANcentral can perform management functions in background while the microcomputer runs other applications.

LANcentral will be available in mid-December for $1,495, a price that includes the software and the controller board.

Racal InterLan can be reached in writing at 155 Swanson Road, Boxborough, Mass. 01719, or call (508) 263-9929.

BMW

How we helped improve the performance of the new BMW.

There's a sleek new shape on the landscape. A gleaming testament to the fine art of engineering. It's the new North American headquarters of BMW. ROLM But like all things BMW, the real power lies under the hood. At the heart of the communications system—the 9751 CBX from ROLM. Why *ROLM,* of all the systems they could have chosen? It began with a set of expectations. A voice message system that was simple to use. ROLM An installation that wasn't a nightmare. Service and support they could count on. All the things they assumed they could get anywhere. But which, surprisingly, only one company had: ROLM. The installation went so smoothly that BMW's normal, efficient operations never hit a bump. ROLM On the first day in the new building, every phone had dial tone, every computer display was aglow. Before long, PhoneMail had become an everyday part of doing business, from the board room to the mail room. But even with all this, a feature that wasn't even on their list of expectations turned out to be the clinching factor: ROLM's association with IBM. This combined expertise in voice and data offered benefits no one else could match. ROLM Voice/data integration, up-to-the-minute solutions and a solid link for the long term. A long term that includes the technology of Siemens, a world leader in ISDN. These days, there's a new standard of performance at BMW. You'll find it parked on every desk: ROLM. ROLM

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First Look

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ports V.42 error correction protocols as part of its product rollout at Comdex/Fall '89 here.

The introduction marks the first time UDS has supported V.42 protocols in its modem line. V.42 is a CCITT error correction algorithm that utilizes the Microcom Network Protocol (MNP) Class 4 and Link Access Procedure M protocols.

V.42bis compresses data by a ratio of 4-to-1. In the case of a 9.6K bit/sec V.32 modem, V.42bis support can result in throughput up to 38.4K bit/sec, according to UDS.

The new **FasTalk V.32/42** is a full-duplex modem that operates in both synchronous and asynchronous modes.

FasTalk V.32/42 also supports full-duplex transmission at 2,400, 1,200 and 300 bit/sec.

The modem automatically negotiates the proper speed and protocol with a remote modem. It supports MNP Class 5 data compression for throughput up to 19.2K bit/sec.

FasTalk V.32/42 is available now. The product carries a list price of $1,045.

The **FasTalk V.32/42b** includes the V.42 error correction capability of the FasTalk V.32/42 offering and supports full-duplex transmission at 2,400, 1,200 and 300 bit/sec.

Like the FasTalk V.32/42, the V.32/42b features a Hayes Microcomputer Products, Inc. AT command set and internal diagnostics that include digital and analog loopback testing.

FasTalk V.32/42b will be available in the first quarter of 1990 for $1,145.

The **FasTalk V.22b/42** is also AT command set-compatible and is optimized for error-free transmission between personal computers or to a host.

The V.22bis modem communicates asynchronously at 300, 1,200 and 2,400 bit/sec. It supports MNP Class 5, which can increase throughput to 4.8K bit/sec.

V.22b/42 will be available in the first quarter of 1990 for $550.

Universal Data Systems, 5000 Bradford Drive, Huntsville, Ala. 35805; (205) 721-8000.

Wang software lets VS users access Unisys A, V Series data

Wang Laboratories, Inc. recently unveiled software that lets users of Wang VS superminicomputers access data and applications stored on Unisys Corp.'s A and V Series mainframes.

The software, **VS-Unisys (Burroughs) Services Release 1.0,** which was developed with InterComputer Communications Corp., also lets users write cooperative applications that run on both the VS and Unisys machines.

VS-Unisys (Burroughs) Services consists of four components. One component provides VS users with Unisys terminal emulation, while a second lets users route Unisys mainframe printer files to a VS printer without affecting regular VS operations.

A third component lets users transfer files between Unisys and VS machines, while the fourth is an application program interface for integrating VS applications with Unisys applications and data.

Available now, VS-Unisys (Burroughs) Services costs $2,000 to $16,000, depending on configuration.

Wang Laboratories, Inc., 1 Industrial Ave., Lowell, Ma. 01851; (617) 459-5000.

Cluster controller links 8 terminals

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Due to the distance limitations of thin-wire Ethernet, the maximum distance between the controller and the host system is 600 feet. Terminals can be up to 150 feet from the controller, which is the RS-232 distance limitation.

Ethernet MH 800 will be available in the first quarter of 1990. The stand-alone unit costs $1,895; optional TCP/IP software costs $200.

StarGate Technologies can be reached in writing at 29300 Aurora Road, Solon, Ohio 44139, or by calling (216) 349-1860. ◪

Fiber LAN boards bow for ISA, EISA

continued from page 31

comes with network drivers for most popular LAN operating systems, including Novell, Inc.'s NetWare, IBM's OS/2 Extended Edition and The Santa Cruz Operation, Inc.'s SCO Unix.

The EISA board, designed for use in computers such as Compaq's new SystemPro and DeskPro, also comes in two versions: the CodeNet-8300 and CodeNet-8301 for passive and active hubs, respectively.

The EISA cards use bus mastering, the technique of gaining exclusive control of the microcomputer's internal bus to support high-speed data transfer from the interface to host memory. Codenoll's EISA boards support internal transfer speeds up to 264M bit/sec, according to Michael Coden, president of Codenoll.

Both versions of the ISA and EISA cards are available now.

The company also announced a CodeNet Starter Kit, which consists of six CodeNet-8330 ISA Ethernet boards, six 20-meter fiber-optic cables and one CodeStar passive fiber-optic hub. The package will sell for $4,995.

By adding $500 per node, users can get EISA boards in the starter kit.

Codenoll can be reached in writing at 1086 N. Broadway, Yonkers, N.Y. 10701, or by calling (914) 965-6300. ◪

Just a few of Dual

THE BEST MODEM FOR NETVIEW ISN'T FROM IBM.

When we announced the new DualView Management Option for 2600 Series modems, it made big news.

And the biggest news is, for the first time you can choose a modem for NetView based on capability instead of compatibility.

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DUALVIEW MAKES NETVIEW WORK BETTER.

DualView expands NetView's modem management capabilities with 10 unique built-in features unavailable on IBM modems.

Plus DualView totally bypasses NetView/PC, so you can monitor your modem network directly from NetView.

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Equinox's 12-port board links async terminals, PCs

Equinox Systems, Inc. recently announced a 12-port board for connecting asynchronous terminals to personal computers running Unix or Xenix. The **Megaport-12** enables microcomputers to support as many as 12 asynchronous terminals at speeds up to 38.4K bit/sec.

The board's proprietary chipset handles processing for attached terminals, freeing the host workstation to run user applications.

The Megaport-12 complements Equinox's Megaport-24 board, which provides up to 24 terminal ports. As many as eight Megaport-12 or Megaport-24 boards can be installed in a single personal computer, providing up to 192 terminal ports.

Megaport-12 is compatible with IBM Personal Computer ATs. The board provides 12 asynchronous RS-232 ports, which support DB-25 and RJ-11 jacks, or a telephone punch block termination.

The board costs $1,295 and will be available in November.

Equinox Systems, Inc., 14260 S.W. 119th Ave., Miami, Fla. 33186; (305) 255-3500.

NCR adds X/Windows terminals to Towerview workstations

NCR Corp. recently added two new X/Windows terminals to its NCR Towerview family of graphics workstations.

The terminals, the 15-in. and 19-in. modular X-Stations, are an enhancement to the company's existing X-Station, which packaged the terminal's logic and display into a single unit.

The new models separate the two subsystems, permitting users to upgrade from a standard 15-in. display to a 19-in. monitor without purchasing a new unit, according to NCR.

In addition, the new terminals support the latest version of X/Windows server software, X11.3. The new terminals can display data from as many as 32 different applications in on-screen windows, the company said.

The products now offer Digital Equipment Corp. VT-100 and VT-220 terminal emulation, whereas the prior model supported only VT-220 emulation.

The 15-in. workstation costs $3,400, and the 19-in. model costs $4,200. Both will be available in December.

NCR Corp., 1601 S. Main St., Dayton, Ohio; (513) 445-7478.

AMP switch bypasses failed nodes on FDDI networks

AMP, Inc. recently introduced a switch for workstations on 100M bit/sec Fiber Distributed Data Interface (FDDI) networks that reroutes traffic from the primary to the secondary fiber ring in the event of a node failure.

The **FDDI Dual Bypass Switch** conforms to the proposed FDDI specification's Physical Media Dependent document, using optical switching to bypass failed nodes on primary and secondary rings without disrupting the network. FDDI uses a dual counterrotating ring topology.

The company said the stand-alone switch can be used at every workstation or it can be connected to a single workstation to serve a cluster. Connection to the workstation can be made via modular plug or Multiple Terminal Emulator receptacle.

Optical switching is electrically activated when a failed node notifies the bypass switch of its status. The switch responds by transferring data traffic to the other ring. The slight motion of a pivoting spherical mirror inside the box, which is 5 inches wide, 5½ inches long and less than an inch high, reroutes the traffic to the other ring.

There will likely be some loss of data because of the time required to switch the traffic to the other ring, according to the company.

The product is available three weeks after receipt of order. It costs $750 in single-unit quantities.

AMP, Inc., P.O. Box 3608, Harrisburg, Pa. 17105; (800) 522-6752.

Advanced Computer rolls out IP router product

Advanced Computer Communications recently introduced a router that connects remote Transmission Control Protocol/Internet Protocol-based Ethernet local-area nets over wide-area links.

The **Advanced Communication System (ACS) 4310 IP Router**, a member of the company's Series 4000 product family, can use High-Level Data Link Control Link Access Procedure B to link thin- or thick-wire Ethernets over point-to-point lines at speeds as high as the European T-1 rate, 2.048M bit/sec, as well as over X.25 links.

The router uses the Routing Information Protocol, a de facto standard dynamic routing protocol for TCP/IP environments. This protocol determines the optimal path for packets to travel and avoids delays caused by bottlenecks or downed links.

Data is routed to the packet's destination rather than being broadcast through the entire network, which prevents unnecessary traffic on the link.

As it receives packets with new network destinations, the ACS 4310 automatically adds new addresses to the routing table.

Like other Series 4000 products, the ACS 4310 uses the Simple Network Management Protocol, which lets users measure traffic loads and isolate network errors.

The product is available 30 days after receipt of order at a cost of $7,500.

Advanced Computer Communications, 720 Santa Barbara St., Santa Barbara, Calif. 93101; (805) 963-9431. ☑

Codex Modem Management System Gives NetView Users More Control

Codex customizes Netview link

BY ELISABETH HORWITT
CW STAFF

CANTON, Mass. — Codex Corp. introduced last week what may be the first direct link between a non-IBM leased-line modem and IBM's Netview.

Codex's Dualview Management Option uses IBM's own Link Problem Determination Aid 2 (LPDA2) protocols to allow Netview operators to monitor, reconfigure and collect alerts and alarms from the Codex 2600 series of high-speed leased-line modems, the vendor said.

However, the Codex product bypasses Netview/PC, IBM's recommended Netview route for third parties, thereby tackling the computer giant on its home ground in the heated high end of the modem market, one

Codex Bypasses NetView/PC

View's rave reviews.

AND EVERYTHING WORKS BEST WITH A CODEX 9800 NETWORK MANAGEMENT SYSTEM.

DualView does more than let your modems talk directly with NetView. It lets you talk simultaneously to a Codex Integrated Network Management System that does a lot of things NetView can't, like predict problems and help solve them, instead of just reacting to them.

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We invite you to give DualView your own review. For more information about how DualView can make NetView more efficient and productive, just give us a call toll free at the number above.

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See the FAXNeT Form on Page #45

OPINIONS

COOPERATIVE ALLIANCES

BY JOHN MCQUILLAN

Industry changes could spell benefits to users

Evidence that the network business is changing is everywhere. In the past, vendors provided proprietary solutions and users accepted them. Now the vendor community is rallying around standard solutions.

The industry tradition has been to offer new products that are better, faster and less expensive than old products. The new trend favors product families that are upward-compatible, have a breadth of capability and can interoperate with other suppliers' products.

In the past, the network business was characterized by rapid innovation in products, usually developed by one or two companies as secretly and rapidly as possible. But now, rather surprisingly, the almost-universal trend is toward the formation of partnerships, alliances and other cooperative efforts. Many companies that have competed for years now recognize that their success depends on mutual cooperation in some areas. Other companies that have paid little or no attention to one another in the past now recognize one another as potential business allies.

> The trend is toward forming partnerships, alliances and other cooperative efforts.
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Other factors are relevant as well. In the last few years, users have had to contend with almost too much innovation. They would prefer that their suppliers concentrate more on matters of compatibility and standardization. In effect, users are saying, "We don't want a faster box; we want a more compatible system." And vendors are responding.

For example, the current management systems are positioned not so much by the beauty of the displays, but by how well the products connect to IBM's NetView and AT&T's Unified Network Management Architecture. Likewise, Digital Equipment Corp.'s next release of DECnet (DECnet Phase V) doesn't focus as much on larger network capabilities or smarter algorithms as it has in the past. Instead, it focuses on full implementation of the Open Systems Interconnection protocols. And even extremely successful companies such as Network Equipment Technologies, Inc. have chosen to set up partnering arrangements, ranging from an alliance with IBM to a deal with cisco Systems, Inc.

All these changes are happening at once and are confusing to many of the players. If everyone is working on compatibility, how can you offer better or faster solutions? If standards are the only way to compete, what role is there for proprietary engineering solutions? How can you partner with a company today that might turn out to be your competitor tomorrow?

The tradition in our business has been one of vigorous innovation with price/performance improvements of 30% to 40% a year in many categories. But this innovation has often come through the development of unique technologies by companies out of the mainstream that are not constrained by standards or by existing marketing relationships.

Will the new drive toward collaboration stifle innovation? Can companies continue to offer the dramatic product improvements of the past and still adhere to the standardization and compatibility required in the future?

For many suppliers, it's tricky learning how to compete and collaborate simultaneously, and it's difficult to say exactly how and when the new era of collaboration will deliver its promised benefits.

McQuillan is president of McQuillan Consulting in Cambridge, Mass. He assists users and vendors in planning future communications systems.

NETWORK WORLD
The Newsweekly of User Networking Strategies

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Network World
Box 9171, 375 Cochituate Road
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EDITORIAL

Beware of vendors pushing products as next standard

In the 1930s, a new genre of cartoon broke away from traditional story line standards by merging film scenes with animation.

Considered the best of the lot was a flick aptly called, "You Ought to Be in Pictures," starring cartoon veteran Porky Pig and a brash newcomer named Daffy Duck. One scene had Daffy perched atop the desk of Warner Bros., Inc. executive Leon Schlessinger, spouting off in his Brooklyn accent about his advantages over Porky.

"Why, I'm a better actor than him," bragged the duck. "Porky never did anything; *I* did all the work."

Even though Daffy made a terrific selling pitch in the scene, an unconvinced Schlessinger booted the narcissistic duck out of his office.

Similarly, users should factor in vendors' marketing biases when evaluating network servers and workstations. We don't mean to suggest that network buyers should boot sales agents out of their offices. But users should take what vendors say with a liberal dose of salt.

For example, in recent weeks, Compaq Computer Corp. announced its SystemPro line of microcomputers based on the Extended Industry Standard Architecture (EISA). Because EISA is a so-called industry standard, Compaq has a terrific sales opportunity.

According to analysts, SystemPro represents a quantum leap over the older DeskPro 386. Based on multiple In Corp. 80386 microprocessors, the SystemPro can be upgraded to support Intel 80486 chips when they become available.

The SystemPro line also supports Novell, Inc.'s NetWare, Microsoft Corp.'s LAN Manager and The Santa Cruz Operation, Inc.'s Unix/386.

The top-of-the-line model supports up to 1.68G bytes of internal disk storage, putting it on par with a new generation of servers, called superservers.

> Similarly, users should factor in vendors' marketing biases when evaluating network servers and workstations.
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Compaq's main marketing message is that the SystemPro is based on the industry-standard EISA architecture, whereas other superserver vendors use proprietary architectures.

SystemPro can accommodate EISA and industry-standard add-on boards, and it can run standard system software. Developed by a group of IBM competitors, EISA is a superset of the Industry Standard Architecture (ISA) used in IBM's original Personal Computer line. The EISA bus provides much higher I/O throughput while maintaining downward compatibility with ISA hardware.

But while Compaq and other EISA proponents may push the technology as a standard, users shouldn't be fooled by the hype. Users create standards; vendors don't.

Although NetFrame Systems, Inc.'s server, for example, may be based on a proprietary architecture, it too could become a standard, albeit a de facto one, if users purchase it in droves.

The fact is, while EISA is likely to become a standard because of the sheer number of vendors supporting it, it isn't yet. And because it isn't, customers should focus on what a product can do.

What applications are available for it today? What is its price/performance ratio relative to other machines in the same class?

What intangibles does the machine offer that could result in savings?

Users of IBM networks will likely want to know if the machine operates without limitation in OS/2 Extended Edition environments.

Buyers should focus on how the machine can fit in a network. Don't take for granted that a product based on so-called industry standards is a sure fit. Make certain of it.

That's all, folks.

SS7

BY NANCI ADLER

Application issues shouldn't delay implementation

Signaling System 7 (SS7) is the network of the future. But the telecommunications industry continues to delay its implementation.

Of course, some users may wonder if this delay matters. In the past two years, SS7's image was tarnished; it became associated with 800 data base service. The use of 800 data base threatens to increase call setup time of all 800 calls, a particularly troublesome problem for users involved in transaction services.

But rather than causing that problem, SS7 will cure it. The 800 data base service *without* SS7 causes unacceptable call setup delays. With SS7, the delays are mitigated or eliminated. The difficulty arises because full implementation of SS7 is not expected until the mid-1990s.

Other applications of SS7 also cloud its image. Because SS7 separates call detail information from the call itself, call information can be stored and processed in a variety of ways. Controversy over the proprietary nature of this information and its use is inevitable.

But these are *application* issues for users, the industry and, if necessary, regulators to iron out. We won't be able to resolve every issue before SS7 is deployed; we shouldn't try. New issues will continue to arise as long as innovators find ways to put technology to use. Unresolved application issues should not stand in the way of technological advantages that can be provided today.

And SS7 *does* bring concrete benefits to telecommunications carriers and users: It increases network efficiencies and reduces equipment requirements. Call setup times for 1+ calls are significantly reduced. And if the network fails, alternate routes through multiple switches can be used without penalty of call setup delays.

If it is obvious that SS7 is a significant and worthwhile technological advancement, why have users not yet seen its benefits? The problem is that users are unable to get the full benefit of SS7 until all networks — local, intra-local access and transport area and inter-LATA — are interconnected with SS7 capabilities. And this interconnectivity is not yet a reality.

Interconnectivity of SS7 networks and ubiquitous service is essential. The advantages of SS7 stem from the fact that call information — including the originating number and terminating number — can be processed through a data network. If any portion of that network is not connected to SS7, its capabilities are severely diminished or rendered useless.

> We won't be able to resolve every issue before SS7 is deployed; we shouldn't try.
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The stumbling block in connectivity lies between local exchange companies and interexchange companies; the process of interconnecting these two is moving ahead at a snail's pace. While competing interexchange carriers have managed to interconnect SS7 networks, interconnectivity between interexchange and local exchange carriers remains a distant goal.

Such connectivity, if SS7 is deployed at the access tandem level, will probably not occur until '92. At the central office level, nationwide interconnectivity could take until '97 or later. Local exchange carriers lack incentive to install SS7 and provide connectivity to interexchange carriers. Monopoly power, rate-of-return regulation and the inertia of large corporations work against the rapid deployment of new technology.

Furthermore, local exchange carriers are keeping interexchange carriers in the dark regarding local exchange interconnection plans, proposed tariff formats and rates. Nor have they developed aggressive schedules for deployment.

For instance, BellSouth Corp. has announced an SS7 connectivity trial with MCI Communications Corp., AT&T and US Sprint Communications Co. for the end of 1989 — one of the first such trials planned. That trial will begin more than one year after the successful interconnection of on-line interexchange carrier SS7 networks.

The SS7 information vacuum is particularly burdensome for small and regional interexchange carriers that are waiting for local exchange carrier interconnection before installing their own SS7 capabilities. Without reasonable information up front, these carriers are forced to wait until local exchange tariffs are filed before making the final implementation decisions. Since it can take six months to a year to order and install SS7 networkwide, the industry is faced with additional delays.

Independent local exchange carriers form another barrier. Their participation is vital to the success of SS7, yet it remains in question. If motivated, independents can provide SS7 connectivity in two ways: directly with their own SS7 equipment and software, or through an adjacent local exchange carrier's facilities. Facility sharing has already been proven possible with the use of Bell operating company access tandems by independent local exchange carriers.

Implementation of nationwide, interconnected SS7 networks should be strongly encouraged, supported and expected. Users, interexchange carriers and, if necessary, regulators can pressure local exchange carriers to provide SS7 network connectivity.

Meanwhile, controversy over specific applications should not block users from the benefits of a technology that can be gained today and should have been here yesterday. ◘

Adler is a consultant with Technologies Management, Inc., a telecommunications consulting firm in Winter Park, Fla.

TELETOONS

BY FRANK AND TROISE

Okay.. aside from the "delete" function, what don't you like about the new voice-mail system?
Phil Frank

LETTERS

Freedom redefined

Hopefully, the following discussion will explain why my article did not contain the "additional facts" about cellular phones imagined by Mr. Charles Kilch in his letter to the editor ("Loss of American freedom," *NW*, Oct. 30).

Whenever I hear people complaining that the Electronic Communications Privacy Act of 1986 (ECPA) resulted in the "loss of another American freedom," I wonder exactly what freedom they have in mind. Is it, perhaps, the freedom to eavesdrop on the conversations of total strangers?

The "loss of freedom" that statement seems to refer to is based on the notion that Congress deemed the airwaves a public resource; but what Congress did in the Communications Act of 1934 was make the electromagnetic spectrum a government domain, which the Federal Communications Commission may share with the public.

The act provided that no one has an entitlement to use of the spectrum, neither those who would transmit nor those who would receive radio signals. One section of the 1934 act criminalized the unauthorized reception and divulgence of radio transmissions, although the provision has never amounted to much. This must be what Mr. Kilch is referring to as the "Privacy of Communications Act."

In short, the airwaves are a public resource in much the same way the White House is a public building; you get to enter only if you're allowed past the guard house. (This, by the way, should not be taken as an endorsement of government stewardship.)

Contrary to the impression of some radio enthusiasts, Congress was not declaring war on radio hobbyists when it passed the ECPA. The law was a rewrite of the Omnibus Crime Control and Safe Streets Act of 1968, the first federal statute to specifically regulate wiretapping.

Consistent with a landmark Supreme Court decision, the 1968 law required police to get a court order before engaging in electronic surveillance. It also prohibited wiretapping by private citizens.

More letters, page 52

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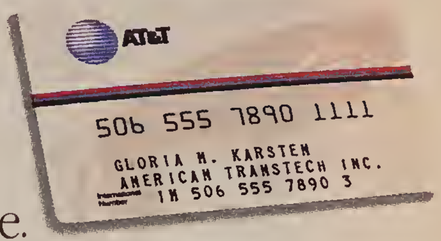

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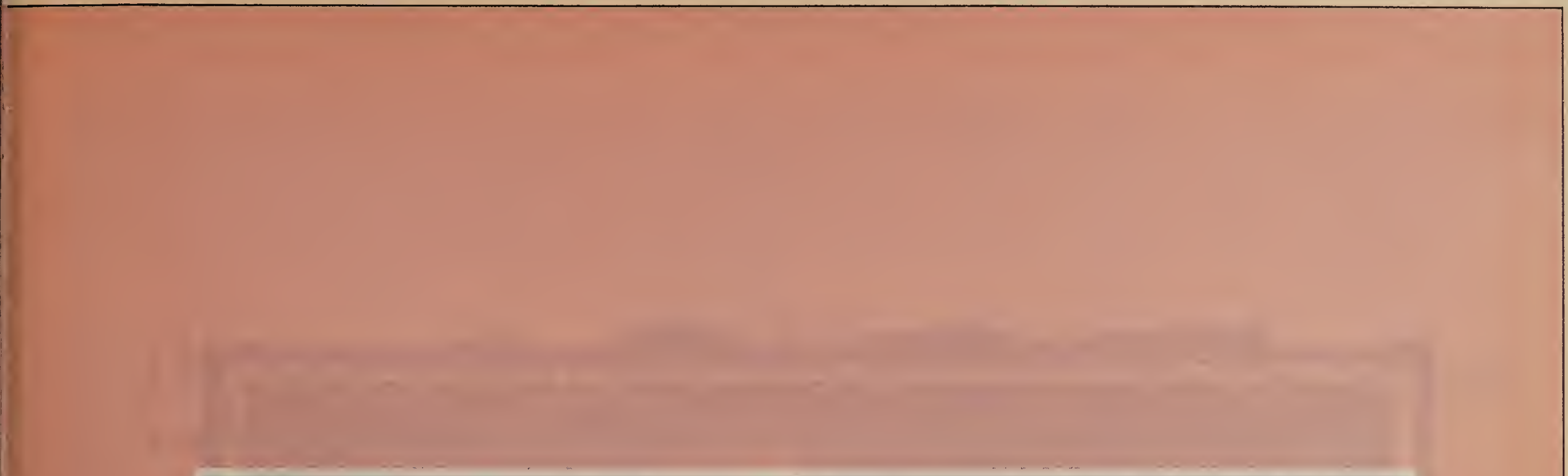

CONTINUED FROM PAGE 1

primarily as a platform for building systems and application software products.

Its reputation as a high-tech "power tool" notwithstanding, RPC technology is gradually working its way into corporate information systems (IS) and telecommunications departments. Organizations are using RPC tool kits from vendors such as Apollo Computer, Inc., Banyan Systems, Inc., Netwise, Inc., Novell, Inc. and Sun Microsystems, Inc. to build applications optimizing their networked servers and workstations. (For a rundown on these vendors' RPC offerings, see the chart on page 44.)

For example, apparel retailer Burlington Coat Factory, Inc., in Lebanon, N.H., has used Sun's RPC environment to build cooperative processing systems for point-of-sale and inventory management applications, according to company MIS Director Michael Prince. "We're using Sun's RPC to tie together Unix and OS/2 environments," Prince says. "It takes a good programmer only a day or so to learn how to build distributed applications using RPCs."

RPC technology gives software developers the ability to split application programs and easily redistribute the procedures to dispersed, intercommunicating computers. RPC tool kits cleave a source-code program into separate client and server pieces in keeping with programmer specifications, then automatically generate the stub code. The stub code coordinates communications among the pieces once they've been installed on separate machines.

The underlying program code need not be modified when distributing an application's components out to remote processors. Management of the run-time network connection between client (calling procedure) and server (called procedure) is handled entirely by RPC stubs and linked communications protocol stacks. The client and server procedures relate to each other as if they were both located on the same machine.

RPC tools relieve programmers from having to know details of network operating systems and communications protocols on which their applications are to run. Programmers are also spared the painstaking, time-consuming labor of coding and debugging communications subroutines by hand.

The business benefits from RPC technology include accelerated network application development, increased programmer productivity, improved network resource utilization, enhanced multivendor interoperability and greater portability of distributed applications across different operating environments.

Standards battle

Recent events have heightened the visibility of RPC products among vendors and users alike — most notably, an announcement by the Open Software Foundation (OSF), a Boston-based vendor consortium that it is seeking industry input toward the establishment of an open standard for RPC technology.

The OSF standards-setting process is shaping up as a dogfight between two industry factions supporting different RPC specifications, although individual members of the factions may choose to propose their own schemes as industry standards.

The first faction — which includes such big-name vendors as Novell, 3Com Corp., Banyan, Sun and Lotus Development Corp. — is rallying around a 2-year-old RPC product developed by Boulder, Colo.-based Netwise. At September's NetWorld '89 conference in Dallas, this coalition announced its support for a vendor-independent RPC tool kit, Netwise's RPC Tool Version 3.0, slated for delivery in early 1990.

The other industry group con-

(continued on page 44)

Kobielus consults on information technology in Alexandria, Va.

Remote procedure call products provide tool kits to help in building distributed network applications.

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(continued from page 41)

sists of Apollo, its corporate parent Hewlett-Packard Co. and other devotees of Apollo's established Network Computing System (NCS) architecture, such as Digital Equipment Corp. In June, Apollo and DEC announced that they were jointly extending the RPC component of NCS and will incorporate the extensions into their respective products.

There's no telling which, if any, RPC standard will prevail. Numerous technical issues figure into the debate. Many of these are on a conceptual plane one or two steps removed from the practical concerns of potential users. In addition, it's unclear how the competing specifications mesh with the OSI draft standard 9072 — Remote Operations Service Element — which pertains to RPCs in multivendor environments.

At this time, the question of RPC standards, and which is best, may be less important than the issue of whether users need RPC technology at all. RPC is an emerging distributed application development technique still groping for recognition within the IS and telecommunications communities.

RPC technology goes up against two alternative, better established approaches to building distributed network applications: network application program interfaces (API) and distributed data base management systems.

What principally distinguishes RPC tools from these other techniques are the issues of application portability and transparency across different operating environments.

"RPCs are a level above network APIs in freeing software developers from the need to know the details of particular network protocols when writing distributed applications," says Mark Leary, a consultant with International Data Corp. (IDC) in Framingham, Mass. APIs are function calls, such as Attach To File Server and Get Printer Status. They are embedded within particular network operating systems, such as Novell's NetWare and 3Com's 3+.

RPC technology goes up against two alternative, better established approaches to building distributed net applications: network APIs and distributed DBMSs.

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Building a distributed application that invokes environment-specific APIs usually means that the application can be ported to other networks only through laborious rewrites.

Distributed DBMSs support a specialized form of cooperative processing involving applications that use data culled from multiple remote data bases, typically those built around relational data base principles. Application-level integration among dispersed data bases is accomplished through a specialized data-retrieval bridge language, often some form of SQL.

IBM's Systems Application Architecture (SAA) is an application development environment for distributed DBMSs — in this case, IBM's Distributed Data Manager running on IBM's OS/2, Application System/400 and ES/370 host operating systems. Most of the applications that can be built using SAA specifications and SAA-compliant tool kits are just sophisticated twists on the time-honored data download/upload technique.

However, IBM plans to incorporate more cooperative-processing capabilities into SAA, according to Jack Karp, vice-president of Meta Group, a consulting firm in Westport, Conn.

In contrast to SAA and other DBMS-oriented environments, RPC products enable developers to do more than just pass data files, records and fields among remote systems. RPCs also make it possible for the flow of control to pass between remote machines executing procedures of the same application as if the dispersed modules were interlocking gears in a single machine. Portability and transparency of RPC applications is ensured by client- and server-side stub code and linked communications protocols.

RPC technology can be thought of as a means for fine-tuning the distribution of processing loads across networked machines. Any mix of capabilities that can be developed to run on a single computer can be decoupled by RPC technology and distributed to devices optimized for particular uses.

Why place all the processing burden on one host machine when table lookup chores can be sent to a data base server, number-crunching assignments to a high-performance processor, printing jobs to a print server, program compilation to a compile server, communications tasks to a protocol gateway and so on?

Within the RPC community, technical comparisons among competing products center on the issues of flexibility, performance and network resource management. The industry's chief concerns are the ability of various RPC products to accommodate different programming, protocol, operating system and hardware environments; provide acceptable application response times and throughput; and coordinate pieces of complex applications dispersed across networks.

The top contenders in the RPC arena — Netwise and Apollo/HP — provide approaches that differ markedly from each other. Netwise's product family, RPC Tool, builds distributed applications incorporating two logical entities — client and server — while Apollo/HP's NCS includes a third entity — the broker.

Perhaps the most significant fact about Netwise's RPC Tool is that it has gained support as an industry standard from the top three local-area network operating system vendors — Novell, 3Com and Banyan. RPCs are first and foremost geared for LAN environments. These and other communications and computer vendors have embraced RPC Tool as a "common distributed computing platform," according to an announcement this September ("Software development kit wins key vendor backing," *NW*, Sept. 18).

Most RPC Tool users are independent software vendors, according to Mark Hatch, Netwise's vice-president for marketing. The main component of RPC Tool is a compiler. Its function is different from that of standard compilers, which convert program source code into executable binary files. The Netwise compiler transforms a single C or Ada language source-code file into two source-code files — client and server — each with attached stub code and communications subroutines. To run in the target host machines, the client and server source-code files produced by Netwise's compiler must still be processed through standard C or Ada compilers/linkers.

NETWORK WORLD

Remote procedure call products

Vendor	Product	Programming languages supported	Machine types supported	Machine OSs supported	Net OS and protocols supported
Apollo Computer, Inc. Chelmsford, Mass. (508) 256-6600	Network Computing System	C, Pascal	Microcomputers, workstations, minicomputers, mainframes, supercomputers	OS/2, Unix (BSD, System V, Ultrix, AIX), VMS, DOS	TCP/IP
Banyan Systems, Inc. Westborough, Mass. (508) 898-1000	NetRPC	C	Any that can run VINES	Any that can support VINES	VINES
Netwise, Inc. Boulder, Colo. (303) 442-8280	RPC TOOL	C, Ada	Microcomputers, workstations, minicomputers, mainframes, supercomputers	DOS, OS/2, Microsoft Corp. Microsoft Windows, Unix (BSD, System V, SunOS, Xenix, Ultrix), VS, MPE, VMS	TCP/IP, SPX/NetWare, NETBIOS, Touch Communications, Inc. OSI, Named Pipes/LAN Manager, VINES, DECnet, NetIPC, Xerox Corp.'s Xerox Network Systems
Novell, Inc. Provo, Utah (801) 379-5900	NetWare RPC	C	Microcomputers, workstations, minicomputers, mainframes, supercomputers	DOS, OS/2, Microsoft Windows, Unix (BSD, System V, SunOS, Xenix, Ultrix), VS, MPE, VMS	TCP/IP, OSI/MAP, DECnet, SNA/APPC, Named Pipes, NETBIOS
Sun Microsystems, Inc. Mountain View, Calif. (415) 960-1300	Open Network Computing	C	Microcomputers, workstations, minicomputers, mainframes, supercomputers	Unix, DOS, VMS, MVS, VM	TCP/IP, SPX, NETBIOS, OSI

BSD = Berkeley Software Division
SPX = Sequenced Packet Exchange

SOURCE: JAMES KOBIELUS, ALEXANDRIA, VA.

Programmers must write a separate input specification file that tells the RPC Tool compiler how to split the application into client and server procedures. For ease of use, the specification language may use the same syntax as the programming language. The specification file declares which procedures will execute remotely and whether the communications path between client and server modules persists between procedure calls or must be reestablished with each call.

The programmer must also write a server control procedure that tells the server module how to manage communications sessions and the flow of control vis-a-vis client procedures. For example, the server could be set up to handle multiple client connections — known as bindings — concurrently, though processing only one RPC at a time.

Many versions of the RPC Tool compiler exist, each supporting a particular operating environment: computer hardware type, machine operating system and network operating system or protocol suite. To execute into different environments, client and server procedures must be developed using the corresponding RPC Tool compilers.

These compilers build client and server stubs that translate between each environment's specialized data representation technique and a machine-independent encoding scheme: ISO standard 8825, Specification of Basic Encoding Rules for Abstract Syntax Notation, also known as ASN.1 BER.

The machine types that RPC Tool supports include IBM-compatible personal computers, as well as larger systems from Alliant Computer Systems, Apollo, Convex Corp., DEC, ELXSI, Ltd., Prime Computer, Inc., Sun and Wang Laboratories, Inc.

Machine operating systems supported include DOS, OS/2, Microsoft's MS-Windows, Unix (Berkeley, System V and Xenix varieties), DEC's Ultrix and VMS, and IBM's VS.

Network operating systems and protocol suites supported include Transmission Control Protocol/Internet Protocol, Novell's NetWare/Sequenced Packet Exchange (SPX), the Network Basic I/O System, Touch Communications, Inc.'s Touch OSI, Microsoft and 3Com's jointly developed LAN Manager/Named Pipes, Banyan's VINES and DEC's DECnet.

Porting a distributed application to different machine types and operating systems involves recompiling the original program code with the appropriate RPC Tool compilers. New and evolving communications protocols, such as the OSI suite, can be added to RPC Tool's Network Library and easily linked to existing client and server stubs.

RPC Tool's flexibility across diverse operating environments has won it support from communications and computer vendors alike. LAN industry leader Novell has been selling NetWare RPC, a licensed version of Netwise's product, since March, according to Dwight Davis, director of marketing at Novell's Austin, Texas-based Development Products Division.

Novell's version supports the company's proprietary SPX protocol for NetWare, but it also supports OSI/Manufacturing Automation Protocol, DEC's DECnet, IBM's Systems Network Architecture/Advanced Program-to-Program Communications, Microsoft and 3Com's Named Pipes and NETBIOS. Support for numerous communications protocols is referred to within the RPC community as transport-independence.

Most NetWare RPC users to date are Novell value-added resellers, says Davis, although some corporate IS departments are

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(continued from page 44)

beginning to pick up on the benefits of RPC technology. "Corporate IS is a bit conservative when it comes to trying out new development techniques," he says. However, Davis predicts that as the RPC market matures, IS and telecommunications professionals will lean toward RPC as a viable technique for linking diverse operating environments.

Unlike Netwise's RPC Tool, Novell's NetWare RPC can only compile application source code written in the C language. This is no handicap, Davis says, because "most distributed application programmers work in C."

How does NetWare RPC relate to Novell's proprietary NetWare APIs, which also provide resources for building distributed applications? "NetWare RPC is for developing customized procedure calls within heterogeneous client/server environments," Davis states, "while our APIs support standardized procedures within the NetWare environment."

Sun already has its own cooperative-processing product, the RPCgen network compiler. In fact, Sun is one of the pioneers in the RPC field, having introduced RPCgen as part of its Open Network Computing (ONC) environment in 1985. Sun's RPC and External Data Representation protocols are the basis upon which the company's network services, such as Network File System (NFS), are created.

Sun will continue to support and enhance its own RPC environment. At the same time, Netwise is engineering RPC Tool Version 3.0's compiler so that programmers can easily build stub code compatible with existing Sun ONC/NFS clients and servers.

Meanwhile, another RPC pioneer, Apollo, is proposing that its own 3-year-old RPC environment, NCS, be considered an industry standard. "Apollo and Sun are ahead of others in RPC technology," says IDC's Leary, "because their whole focus as technical computing vendors has been on distributed computing."

Building RPC applications in Apollo's environment is not different in principle from the Netwise and Sun architectures. NCS has a compiler that, in accordance with an input specification file, produces client and server procedures with linked stub codes and protocol stacks. NCS supports a range of computer hardware types, machine operating systems, network operating systems and protocol suites similar to the Netwise/Sun products.

What chiefly distinguishes Apollo's architecture from the Netwise/Sun RPC architectures is the broker concept — Apollo's technique for coordinating and managing dispersed client and server procedures.

Installed on each server machine, the location broker is a data base that tracks the locations of server procedures and routes client requests to the appropriate destination. Dispersed server processes and data bases can be flexibly relocated.

The NCS location broker maintains an updated directory of server locations and transparently routes client requests to the most appropriate server. The location broker architecture eliminates the need to reprogram client procedures every time a server is relocated.

The prime benefit of this arrangement is "location independence" in the distribution of remote procedures. Without brokers, the clients themselves must keep track of servers and their locations, as they are required to under the Netwise and Sun RPCs.

Another difference between NCS and other RPC schemes is that the former allows communications between like processors in their native, low-level data representation scheme, rather than translating into a machine-independent scheme such as Netwise's ASN.1 BER. Use of native data representation schemes, where possible, provides a performance advantage in client/server transmissions.

NCS provides the requisite "power for heavy-duty RPC applications," according to Duncan Campbell, marketing manager in HP's Networks Division in Fort Collins, Colo. Campbell says NCS has been licensed for systems development by many computer vendors, including IBM and DEC.

In fact, Apollo has been working with DEC since February to extend NCS' support for wide-area networks, international language representation, additional network protocols and large data processing applications. The extensions will be incorporated into both companies' products.

Despite recent efforts, DEC and IBM have been conspicuously absent from the RPC community, according to RPC veteran Jim Allchin, vice-president of research and development at Westborough, Mass.-based Banyan. Allchin, lead developer of Banyan's 6-year-old NetRPC product, says the computer industry leaders "don't understand distributed processing." The closest IBM has come to an RPC offering, he says, is with its Server-Requester Programming Interface specification, which does not include a compiler for building distributed applications.

Of course, nobody's counting IBM out of the RPC fray just yet. Big Blue has been a latecomer to other technologies — most notably, personal computers — that it eventually dominated. It wouldn't be at all surprising if RPC concepts were eventually incorporated into Ad/Cycle, the firm's fast unfolding SAA/CASE environment.

Dominance in the young RPC market is up for grabs. Regardless of which standard emerges from the OSF process, RPC technology is likely to gain needed visibility and acceptance among mainstream IS and telecommunications professionals.

RPC is a concept so simple it almost seems inevitable. Programmers are always clamoring for power tools that improve the design and performance of their applications. Give them the means to harness the ultimate computer — an entire network of processors — and they'll never look back. ◼

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Tearing down the wall

By KRIS HERBST

Recently announced products for linking IBM Personal Computer- and Personal System/2-type computers with Apple Computer, Inc.'s Macintosh are blasting holes in the Berlin Wall that has separated these two platforms.

Interconnecting Macintoshes and personal computers is becoming easier as vendors respond to a growing demand for heterogeneous networking solutions.

The market for personal computer-to-Macintosh local-area network software is expected to grow from 2.9 million networked personal computers and Macintoshes in 1987 to 30 million in 1991, according to Infonetics, Inc., a market research firm in Santa Clara, Calif.

Acceptance of the Macintosh in corporate environments is increasing. "Every major player in the LAN world has either partially addressed this or is moving rapidly to address it," says Lee Doyle, manager of LAN research for International Data Corp. (IDC), a market research firm based in Framingham, Mass.

Connectivity — once the Achilles' heel of Apple's Macintosh family of computers — is now being addressed by a rapidly expanding array of products that allow Macintoshes and personal computers to share files, printers and other network resources on many types of networks, including Apple LocalTalk, Arcnet, Ethernet and token-ring networks.

Cupertino, Calif.-based Apple and Novell, Inc. of Provo, Utah, two of the five vendors that dominate the market for LAN software interconnecting Macintoshes and personal computers, support Apple's native networking protocol, the Apple Filing Protocol (AFP).

The remaining three vendors — The TOPS Division of Sun Microsystems, Inc. of Alameda, Calif., 3Com Corp. of Santa Clara, Calif., and Banyan Systems, Inc. of Westborough, Mass. — have announced plans to make their LANs AFP-compliant in the near future.

Peer-to-peer networks

Until very recently, TOPS had provided the simplest, most inexpensive and most popular LAN for small work groups of Macintoshes and personal computers. Available since 1986, TOPS was one of the first networks to interconnect the two.

Before this summer's introduction of the Personal Server Network (PSN), a product from Calabasas, Calif.-based Information Presentation Technologies, Inc., TOPS was the only network for Macintoshes and personal computers that could be operated either as a centralized network with dedicated file servers or as a distributed peer-to-peer network.

PSN is challenging TOPS' domination of the low end of the market for personal computer-to-Macintosh LANs. Unlike TOPS,

(continued on page 48)

Herbst is a free-lance writer based in the Washington, D.C. area.

The barriers to connectivity between personal computer and Macintosh networks are crumbling as vendors respond to users' demands for solutions.

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(continued from page 47)

PSN is fully compatible with AFP — a feature TOPS has announced it will offer early next year — and it uses Apple's networking interface. When used with Information Presentation Technologies' uShare server products, PSN also supports Unix nodes.

Peer-to-peer networks require no dedicated server or network administrator because all machines on a network can act as both clients and servers. Any Macintosh or personal computer can access some or all of the files on any other Macintosh or personal computer over the network. Or any such device can "mount" a remote disk, in which case it functions as if it were a drive of that station. Macintosh users see icon symbols for files and folders (directories). Personal computer users see DOS-type listings of files.

Personal computers and Macintoshes can directly read applications that share a common file format or have built-in translators, such as Lotus Development Corp.'s Lotus 1-2-3, Microsoft Corp.'s Microsoft Excel and Microsoft Word, Word Perfect Corp.'s Word Perfect and Aldus Corp.'s PageMaker.

For applications that do not have built-in file translation, TOPS bundles Datavis, Inc.'s MacLinkPlus utility. However, these applications lack a "file format standard that enables the most complete data transmission between environments," says Abigail Christopher, program manager for Macintosh market research at IDC. "I think this really is a problem."

TOPS' NetPrint software allows personal computers to send files to a PostScript-compatible laser printer using Apple networking protocols. Even if personal computer files are generated using non-PostScript-compatible application software, they can be printed using an Epson Corp. printer-to-PostScript translation.

> Dispensing with a dedicated file server saves money and makes distributed peer-to-peer networks easy to run.
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Dispensing with a dedicated file server saves money and makes distributed peer-to-peer networks easy to run. Rich Shapero, vice-president and general manager for TOPS, also notes that "one of the nice things about peer-to-peer architecture is that you don't have a bottleneck where there is contention for the central server.

"Most server-based LANs are PC-based and tend to be unidirectional, meaning that you have a Mac client that can look at files on a PC but not necessarily the other way around," he says. "The whole concept of TOPS' peer-to-peer architecture is that every user can manage his or her own files and make them available to other users on the network, regardless of platform."

On the other hand, without a central file server, a distributed network's operating system must occupy a relatively large amount of random-access memory on each machine. This can become unwieldy on distributed networks that require a lot of systems administration.

"If you have a reason to have files that are centrally administered, server-based LANs are architecturally more suited to those functions," Shapero admits. However, be sure to include access privileges for all users or centralized backup and recovery.

But, he adds, for simply sharing disks, printers and personal files, a peer-to-peer network "is absolutely the network of choice. Distributed architecture is very suitable — and even preferable — for situations where people are sharing data among themselves, as opposed to going to a central repository for data."

Besides having little competition prior to the introduction of PSN, the TOPS network has been popular because it has proven to be an attractive solution for small firms with limited budgets, networking expertise and LAN requirements, as well as for some firms with more intensive networking requirements.

When Seymour Cray left Cray Research, Inc. last year to found Cray Computer Corp. of Colorado Springs, his new firm selected TOPS software to network the 15 personal computers and 150 Macintoshes it is using to design a new generation of supercomputer, dubbed Cray 3.

"We've been using TOPS for almost a year now, and it's doing the job we wanted it to do," says Jerry Stevens, a systems information specialist for Cray Computer. "We like it because, as a distributed type of network, it can allow a Mac or PC to act as a server or, at the same time, it can act as a client of other users."

Stevens says that TOPS' high degree of connectivity, which allows each workstation user to share files with all other workstation users, has helped Cray Computer cope with development work that is advancing on several fronts simultaneously and is generating large amounts of data.

TOPS and PSN are both plug- and software-compatible with AppleTalk, Apple's proprietary LAN for Macintosh computers. Connecting personal computers to these networks requires adding an adapter board to each personal computer. TOPS' personal computer adapter board and the optional equivalent for the Macintosh run on a superset of Apple's LocalTalk that TOPS calls FlashTalk.

In the past, Apple has used the term "AppleTalk" to refer to both its overall LAN system and the Macintosh's cabling components. To avoid confusion, it now uses "LocalTalk" to describe the physical connecting components of the net, "AppleTalk" to describe its overall networking system and "AppleShare" to refer to its file and print server software.

TOPS FlashTalk cards triple the communications speed on a TOPS net from Apple LocalTalk's sluggish 230.4K to 770K bit/sec.

These relatively slow speeds may be adequate for light to medium application throughput requirements, such as logon, and linking and launching network applications such as electronic mail, word processing and data managers. However, they are not satisfactory when a net grows to 10 or more nodes, when there are frequent file I/O or print requests, or when transferring long files, such as the data-intensive graphics files for which the Macintosh is especially well-suited.

The slow speeds on these nets can be increased by upgrading the file server or installing accelerator boards or adapter boards that allow the use of Ethernet running on twisted-pair or coaxial cable at 10M bit/sec.

These alternatives to LocalTalk — as well as upgrading the file server or introducing other products such as amplifiers, bridges, repeaters and cabling systems that permit the use of regular phone wire or fiber-optic cable — allow for increased transmission speeds, longer cable runs and installation of a larger number of nodes on an AppleTalk network.

Still, these networks have limitations. Some users are wary about using TOPS on networks of more than 10 nodes or at higher speeds on Ethernet. TOPS has had to respond to numerous complaints about corruption of large (25 bytes or more) multiuser data base files on TOPS running on Ethernet. In addition, "they don't support multiuser applications as well as some other networks," IDC's Doyle says.

AppleTalk

For somewhat larger networks, Apple's AppleTalk LAN is a relatively inexpensive solution, especially if a significant portion of your computers are Macintoshes. This is because the hardware and software for connecting to an AppleTalk LAN is built into every Macintosh, as well as Apple's LaserWriter and ImageWriter printers.

All that is required to connect a Macintosh to an AppleTalk are cables that have a set of small connector boxes and can be plugged into the printer port. For this reason, most networked Macintoshes use Apple's AppleTalk LAN.

Ease of use is one of AppleTalk's major advantages. Users without any technical skills can install a network of Macintoshes simply by plugging in and following simple menu commands.

Installing personal computer nodes, however, requires a good command of DOS file and directory structures. Personal computers must be equipped with cables, software to operate on AppleTalk and a LocalTalk personal computer card, which makes each personal computer a client of any server running under AFP.

> "LocalTalk is very 'plug and play,' " Doyle says. "It is cheap, easy to administer and easy to fix. It has a lot going for it."
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"LocalTalk is very 'plug and play,' " Doyle says. "It is cheap, easy to administer and easy to fix. It has a lot going for it."

AppleTalk's primary drawbacks are LocalTalk's slow 230.4K bit/sec speed, its limited node capacity and — compared to peer-to-peer networks — the cost of adding a dedicated server, particularly if the server is the relatively expensive Macintosh II. LocalTalk's speed is the lowest rated throughput of any wiring scheme in the LAN industry.

Also, Apple recommends installing no more than 32 nodes on a single LocalTalk network and limiting the overall length of cables to 1,000 feet due to AppleTalk's bandwidth and power limitations. All of these problems can be at least partially mitigated by third-party solutions.

When you use a Macintosh II as a file server, you pay for but don't use its graphics and sound capabilities, and most of its processing power. However, you can save about $1,000 by not purchasing the monitor, keyboard and mouse. Timbuktu, a software program from Berkeley, Calif.-based Farallon Computing, allows another Macintosh on the network to control such a "headless" server.

Third-party vendors provide software and boards that allow DOS-based machines to be used as dedicated AFP file servers on AppleTalk networks, but they run much slower than a Macintosh II.

Jasmine Technologies, Inc. of San Francisco has a new product called DirectServe, a memory board/hard disk combination based on Macintosh hardware and software that costs $1,299. Jasmine Technologies claims that DirectServe runs significantly faster than a Macintosh server.

AppleTalk networks include AppleShare software. The AppleShare File Server works like any Macintosh drive and has built-in file- and folder-protection schemes. Files on the server appear the same as local files to the personal computer user, making the LAN transparent to the user.

Apple's PC LaserWriter software allows personal computers to send PostScript-compatible files directly to a printer. Although less convenient, personal computer users can send a file from a non-PostScript-compatible application to an Apple printer by submitting it as an Epson-compatible print file, then quitting the DOS application and submitting the print file to a program called AppleTalk PC Printer Driver.

As with TOPS and PSN, LocalTalk cabling can be replaced with third-party twisted-pair wiring, coaxial cable or fiber-optic systems. It can be speeded up with accelerator cards or by adding adapter cards that allow Macintoshes and personal computers on AppleTalk to run on Ethernet or token ring (16M bit/sec).

These alternatives to LocalTalk and other products such as amplifiers, bridges and repeaters allow for increased transmission speeds, longer cable runs and installation of a larger number of nodes on an AppleTalk network.

PC networks

You may want to use a personal computer LAN if you need a larger LAN with more sophisticated networking features, if you have more personal computers than Macintoshes to connect to the network or if you have already invested in a personal computer LAN. The top two contenders in the personal computer LAN market are Novell's NetWare and 3Com Corp.'s 3 + LAN.

Novell is the LAN industry leader, controlling 53.6% of the market. 3Com, with a 9.2% market share, falls between Apple (13.3%) and TOPS (8.7%), according to Dave Perro, an industry analyst for Dataquest, Inc., a San Jose, Calif.-based research firm. Banyan Systems, Inc., which has a 5% market share, can only connect Macintoshes to its VINES operating system via third-party E-mail software until Banyan releases an AFP-compli-

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ant version of VINES, scheduled for early next year.

3Com's 3+ has been the personal computer network of choice for Macintosh users because it was the first personal computer LAN to support the Macintosh. 3Com has supported the Macintosh in some fashion for four years, its network servers have included a LocalTalk port since 1986, and it shipped its first Macintosh networking products before Apple announced AFP (which is why 3Com has not supported AFP thus far).

3Com's 3+Share personal computer server software, which provides Network Basic I/O System file service to networked personal computers, can be run with 3+ for Macintosh (3+Mac), an extension of 3+Share that allows AppleTalk, Ethernet or token-ring connections between Macintoshes and personal computers.

3+Open, 3Com's network operating system based on Microsoft's OS/2 LAN Manager, will include AFP and Apple's Printer Access Protocol, allowing Macintoshes to connect to 3Com's DOS- and OS/2-based nets using the AppleShare networking software in the Macintosh.

3Com's file servers, called 3Servers, are designed to run on midsize to large-scale Ethernet networks. One-third of all 3Servers shipped to date are configured with Macintosh software.

Because of its dominant market position, Novell instantly became a major competitor of 3Com's 3+Mac late last year when it released NetWare for Macintosh. This software package implements AppleTalk protocols on any NetWare personal computer server running Version 2.15 or higher of NetWare server software.

> Because of its market position, Novell instantly became a competitor of 3Com's 3+Mac last year when it released NetWare for Macintosh.
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NetWare for the Macintosh allows Macintoshes that can access an AppleShare server to access a NetWare server also, without any additional client software. The NetWare server looks like an AppleShare server to Macintosh users.

The argument about whether 3+ or NetWare is superior for connecting Macintoshes and personal computers has revolved around the significance of Novell's AFP compatibility, a point that will become moot once 3Com releases the AFP-compatible 3+Open. The argument also centers on which network does a better job of supporting Macintosh users in a familiar Macintosh-like environment.

3Com argues that software developers thus far have released virtually no Macintosh applications that rely on AFP. Some Novell users say that by using AFP, Novell has done a better job of preserving the look and feel of the Macintosh.

"The one thing we really like about Novell is that it's exactly like AppleShare," says Chris Gladwin, LAN evaluation specialist for the computing standards department of Martin Marietta Corp. in Chantilly, Va. "We wanted to migrate from AppleShare to NetWare, and we were able to do that with absolutely no retraining of users. That was of great value."

> "It's as simple as this: With AFP, you're safe; you know it's going to work," says Chris Gladwin.
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Gladwin says NetWare's AFP compatibility also helped persuade Martin Marietta to use NetWare to link Macintoshes and personal computers.

"AFP is a standard dictated by Apple and embraced by the vendors," he says. "In their conversations with us, Apple has made it absolutely clear that they are going to make AFP a standard in the Macintosh world and all their vendors are going to support it. It's as simple as this: With AFP, you're safe; you know it's going to work. Without AFP, there is a chance of it not working."

Regardless of what type of LAN you choose, you will find that with each updated version of their product, personal computer LAN vendors are moving closer to giving Macintosh users equal access to network resources and capabilities that they provide for personal computer users while doing a better job of preserving the Apple interface that has made the Macintosh such a popular platform.

Whether you install an ad hoc solution, peer-to-peer LAN, Apple LAN or personal computer LAN for linking Macintoshes and personal computers, you will find the walls between these two platforms are falling with each new round of networking products. ▣

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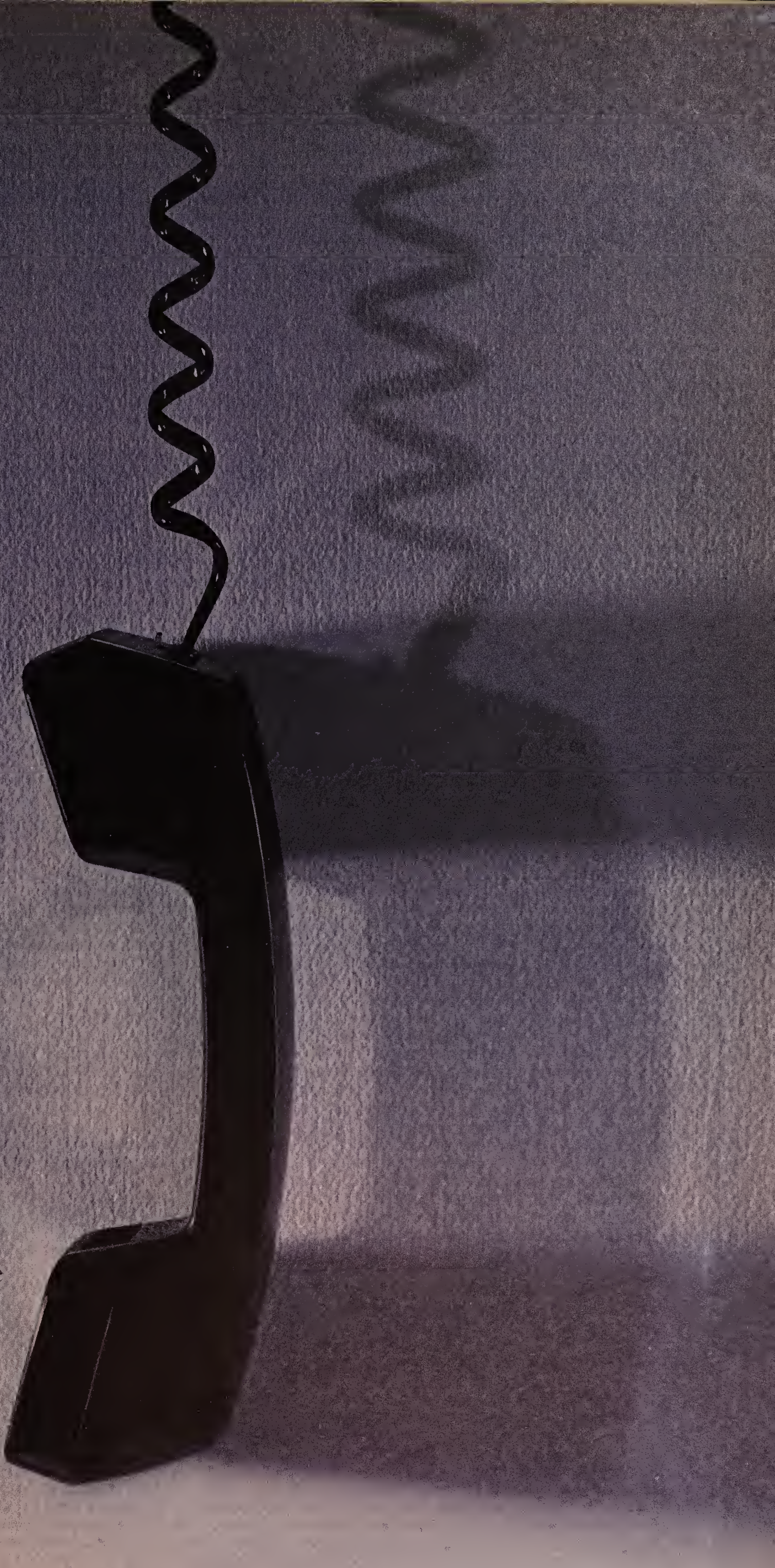

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Letters

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Pressure mounted to update the law as it became clear that it did not extend protection to new communications technologies, including cellular phones. The general idea was that police should get court authorization before they embark on an electronic stakeout. The ECPA, which resulted from that idea, adopted this concept for many new technologies and also retained the prohibition on private surveillance.

Congress, largely at the urging of the Department of Justice, came to the realization that many radio-based communications technologies are inherently vulnerable.

So it exempted from the ECPA's coverage certain technologies considered to be "readily accessible to the general public." Cellular telephones escaped such exemption, not because of a sound technical reason, but largely because of the lobbying efforts of the cellular industry.

As I noted in my article, legislation does not change the laws of physics. The industry, which has never openly acknowledged its vulnerability to its subscribers, nevertheless sought some sort of Good Housekeeping Seal of Approval through passage of the ECPA. The FCC has attempted to perpetuate the myth of privacy by declining to require labels on cellular phones or radio scanners.

The privacy problem is primarily a matter of perception. The general public does not perceive the vulnerability of cellular telephones to surveillance; the industry, backed by the government, would like to keep it that way.

Perhaps if people were more aware of the risks, the industry would get serious about encryption. Or, in any event, we might find out if a market exists for encryption.

Finally, hobbyists needn't get overly concerned about being rounded up by the airwaves police. Even if it is possible to detect the interception of a cellular call, it is simply not practical to do so. Besides, the government has all but announced that it is not going to enforce restrictions on private cellular interceptions.

Robert Corn-Revere
Attorney
Hogan & Hartson
Washington, D.C.

Key to cabling is planning

In response to James Carlini's "Alligators in the swamp" article ("STP — the phone company's edge," *NW,* Sept. 11), I believe he has oversimplified the cabling problem and has given the reader a distorted view of cable planning and the need for keeping certain information proprietary.

In the case where the manager was left with insufficient spares for his project, it was obvious that the installation of the switch had already begun before it was determined how many cable pairs were needed.

As any net manager will tell you, the capacity of existing cable should be checked during the *planning* stage, not the implementation stage.

A call to the local telephone company marketing office with the request for the number of circuits needed will bring about a check of facilities, and shortcomings will be noticed in advance of actual need.

The type of problem to which Mr. Carlini alludes is usually caused in a downtown area by the construction of a new building that the developer stated was going to be occupied by companies with average telecommunications needs.

But six months later, Gargantuan Data Sharers moves in and they need 1,200 lines in two weeks.

So the needed 1,200 pairs are borrowed from the building next door, which has 4,000 pairs assigned to it, 1,200 of which are spare.

Most users don't realize that cable layout involves a large amount of data from planning boards and developers, as well as forecasts of future needs by existing users and the availability of routes and conduit. These are all major factors that determine how much and where cable is deployed.

The results will only be as accurate as the input.

We must also realize that if every feed was diversified, it would exponentially complicate the above problems. We would have twice as much diversified cable than needed in one location and only half as much as needed in the second location.

As for the proprietary issue, if the information is critical to the success of an installation and does not involve dissemination of information that could compromise another subscriber service, then it should be shared. To my knowledge, information such as the number of spare pairs at a particular location has never been restricted.

The problem with the Spanning Tree Protocol is that few requesters understand the responsibility the telephone companies have to other users.

Although a particular manager is only concerned with the 1,200 lines in his building, the telephone company is concerned with the quarter of a million circuits throughout the city. Many of these are critical lines directly used for security, emergency and public safety.

If anything, the telephone companies should be less proprietary about why they're doing something than about what or how they're doing it.

Alex Lynch
Network applications manager
New Jersey Bell
Telephone Co.
Woodbridge, N.J.

DEC left behind

After reading your feature article on LAN servers ("Tough choices face LAN server shoppers," *NW,* Oct. 16), I feel that you have done a great disservice to your readers by not mentioning Digital Equipment Corp.'s Personal Computer System Architecture (PCSA) product line.

PCSA is built on top of DEC's Network Basic I/O System-compatible DECnet-DOS software and uses an Ethernet controller card from either DEC or a third party. It provides virtual disk emulation and file sharing with VAX/VMS servers.

PCSA also provides VT-200 terminal emulation using DEC's high-speed Local Area Transport protocol and optional IBM 3170 emulation. Print spooling is included as well.

Unlike MS-DOS, VMS is a multitasking operating system; the server can perform many additional functions. Furthermore, the Digital Command Language used by VMS is very similar to MS-DOS, meaning that personal computer users should adapt to VMS faster than to Unix. DEC provides a graphical interface — DECWindows-DOS, based on X/Windows — for users who do not like command languages.

Finally, it should be noted that PCSA is an "architecture," with MS-DOS being the first element of the product line. Future products serving OS/2 and Apple Computer, Inc. Macintoshes can be expected.

Jack Patteeuw
Software specialist
Ford Motor Co.
Dearborn, Mich.

Clarifications

In the Oct. 30 issue of *Network World,* the article "Academics at Educom '89 lament cost of technology" contained several inaccuracies concerning my comments at Educom that I think need to be pointed out. These include the following:

- In discussing the problems of small universities connecting to national networks, the statistics I quoted were for universities connected to NSFnet, not BitNet, as the article states.
- I made no comments implying that the cost of joining a nationwide net such as the "NSF BitNet network" was $500,000. The article makes this statement and appears to imply that I made it.
- Concerning PREPnet, my comments were that our mandate was to provide affordable connectivity for all Pennsylvania colleges and universities, and not just for the well-endowed ones. I did not imply that we were required to provide connectivity for all state universities, and clearly we do not have a mandate to provide connectivity for all Pennsylvania companies.

And, oh yes, the proper spelling of my last name is Augustson, not Auguston, a common misspelling no matter where I seem to appear.

I hope these corrections help clarify the points I was trying to make at Educom. Thank you.

J. Gary Augustson
Executive director
Computer and
Information Systems
Pennsylvania State University
University Park, Pa.

Industry Briefs

continued from page 11

Telemail) electronic messaging service with new X.400 service between the U.S. and Hong Kong, Malaysia and Finland.

The service will be provided through US Sprint's newly formed **Sprint International** group, which was formed by combining the data communications services of Telenet Communications Corp. and US Sprint's international voice services.

US Sprint now offers commercial X.400 service between the U.S. and 12 countries, including Australia and Japan. SprintMail has more than 300,000 users worldwide.

QPSX Communications, Ltd., an Australian metropolitan-area net vendor, last week announced that it has signed a 10-year manufacturing and marketing agreement with Siemens AG, giving Siemens the right to manufacture and sell QPSX products in North America and Europe.

This agreement comes closely on the heels of a similar pact signed two months ago between QPSX and Alcatel N.V., based in Brussels, Belgium.

"We realized early on that the U.S. market is too big for us to address directly, so we tried to find appropriate partners to do the manufacturing and marketing for us," said Achilles Perdikaris, vice-president of network systems at QPSX's U.S. subsidiary, QPSX Systems, Inc., based in Holmdel, N.J.

Perdikaris described the Siemens and Alcatel agreements as "complete technology transfers," which will allow the two companies to evolve the QPSX products — now in prototype development — by giving them value-added enhancements.

The QPSX metropolitan-area network products are designed to transmit voice, data and video traffic over the same communications line at speeds of up to 140M bit/sec and share common switching equipment.

QPSX plans to collaborate with Siemens and Alcatel on future versions of the products, including models designed to support Synchronous Optical Network-based networks at 155M bit/sec.

David Systems, Inc. last week said it has raised $11 million in a fourth round of venture capital financing.

The company said it will use the funds to continue its development of advanced telecommunications systems, including Integrated Services Digital Network and local-area network products.

All of the participants in the most recent financing round were already investors in David Systems. These companies are: Technology Venture Investors, Sequoia Capital, Institutional Venture Partners and PaineWebber Development Corp., as well as corporations such as Sharp Corp. of Japan and Pirelli S.p.A. of Italy.

Since David Systems was formed in 1982, it has raised a total of $28 million in previous venture financing rounds.

David Systems recently signed a number of marketing and distribution agreements with companies including Pacific Bell, Ameritech and Contel Corp. The company also recently established a nationwide distribution network for ExpressNet — an Ethernet product that runs over telephone-type wiring — which includes over 60 systems integrators and OEMs.

People & Positions

continued from page 11

maker of fiber-optic local- and metropolitan-area network products, last week said it has hired one of the foremost authorities on metropolitan-area net standards.

The company named **James Mollenauer** to the newly created position of vice-president for advanced technology.

Since 1982, Mollenauer has chaired the Institute of Electrical and Electronics Engineers, Inc. Project 802.6, the metropolitan-area network standards group. This committee is close to completing a set of standards for city-wide nets that will provide voice, video and very high-speed and low-speed data services.

Mollenauer will be responsible for all advanced technology and standards employed in Artel's new products and will represent Artel at standards meetings.

Before joining Artel, Mollenauer was principal technical consultant at Prime Computer, Inc. in Natick, Mass.

Data General Corp. last week elected **Edson de Castro** chairman of the board of the Westborough, Mass.-based computer and communications equipment company.

Ronald Skates, well known at DG for his financial management skills, was named to succeed de Castro as president and chief executive officer. Skates has held the post of executive vice-president and chief operating officer, with responsibility for day-to-day operations at the company, since August 1988.

No one yet has been named to replace Skates as chief operating officer.

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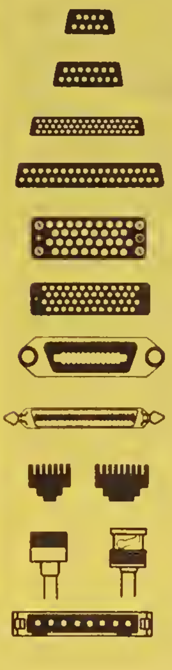

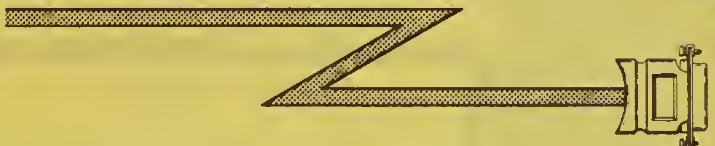

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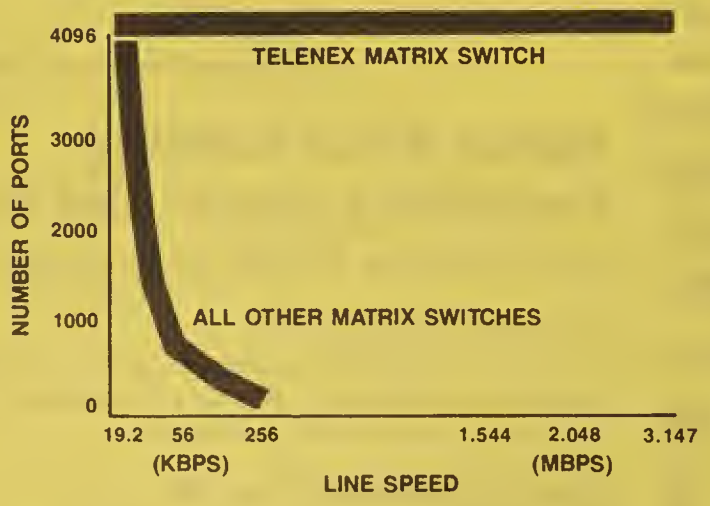

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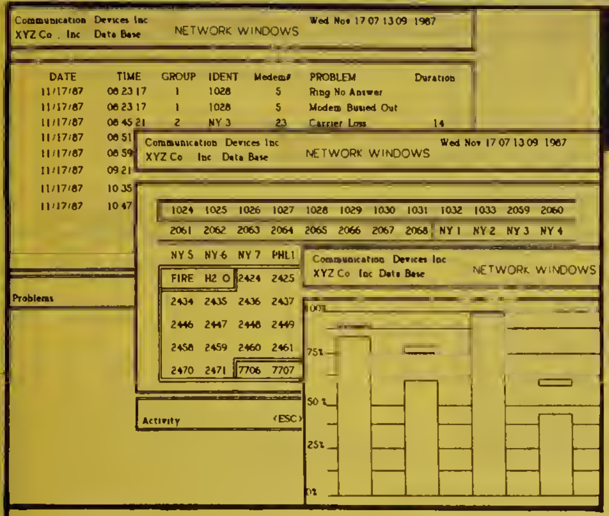

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DATE      TIME      GROUP  IDENT  Modem#  PROBLEM            Duration
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11/17/87  08 23 17  1      1028   5       Modem Bussed Out
11/17/87  08 45 21  2      NY 3   23      Carrier Loss       14
11/17/87  08 51
11/17/87  08 59
11/17/87  09 21
11/17/87  10 35
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NY 5 NY 6 NY 7 PHL1
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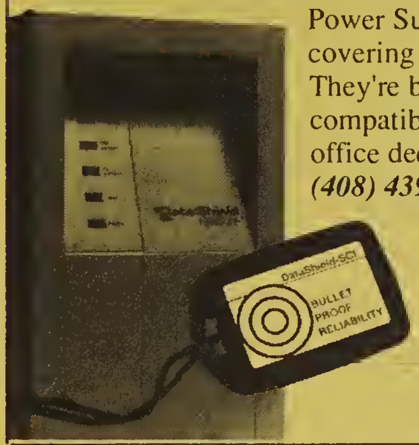

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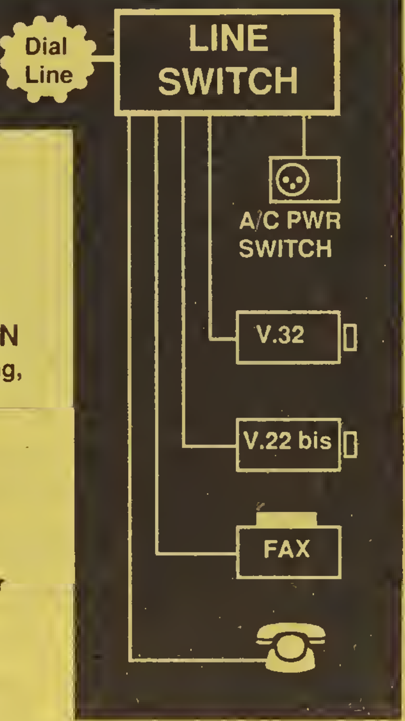

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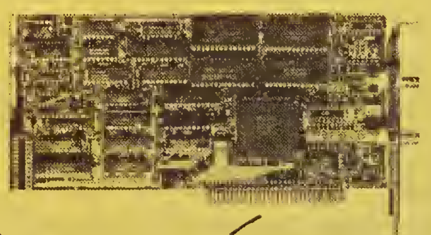

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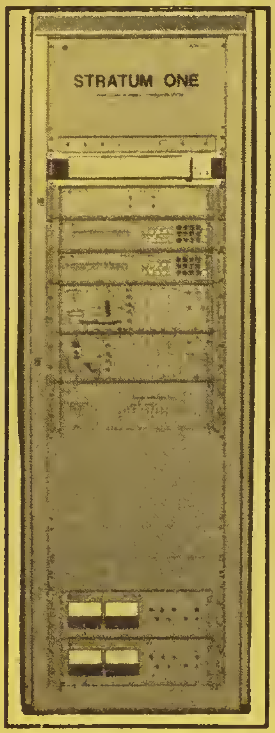

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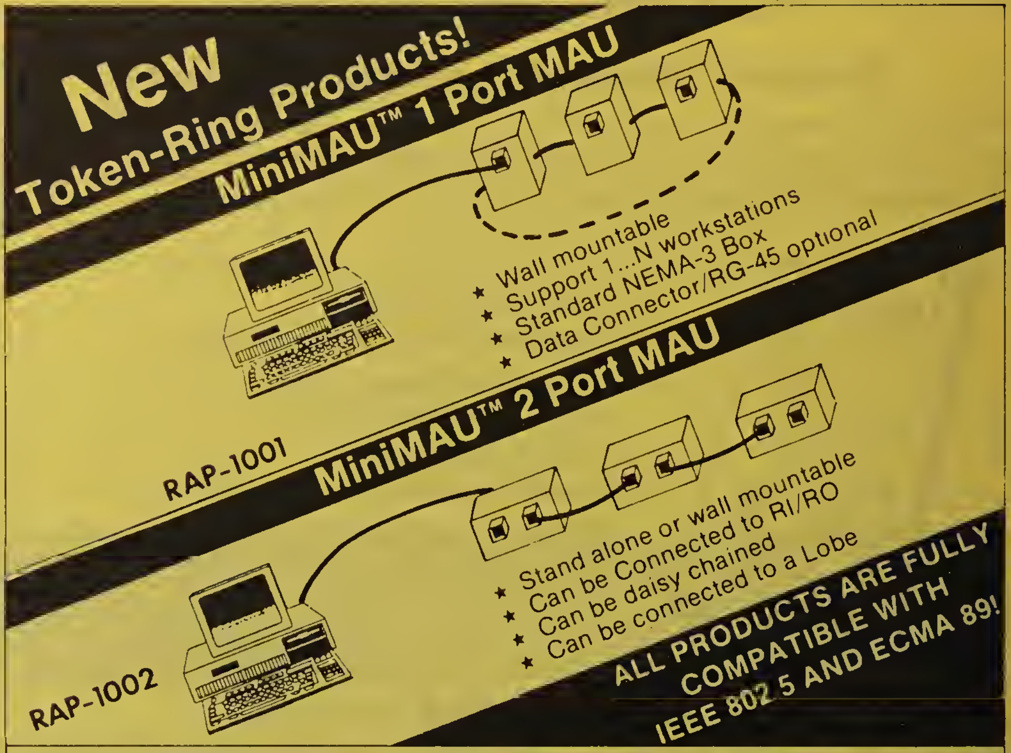

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StrataCom, Vitalink join forces for R&D endeavor

BOSTON — StrataCom, Inc. and Vitalink Communications Corp. last week announced their intentions to jointly develop a network management system capable of controlling their respective T-1 multiplexer and local-area net bridge products.

The joint development effort is an offshoot of work both companies are doing to build links to Digital Equipment Corp.'s Enterprise Management Architecture (EMA). StrataCom and Vitalink, two of DEC's seven charter EMA partners, began discussing the possibility of working together while attending EMA briefings.

Officials from the two companies said the joint development effort will benefit users wanting to manage T-1 networks that support LAN bridges as separate entities.

"We do not presume that we will be supplying an umbrella management system," said Tim Lee-Thorp, Vitalink's network management product manager. "That is precisely the program Digital is undertaking with EMA."

WAN Manager base

The jointly developed product will be based on Vitalink's existing WAN Manager, which consists of an Ultrix-based DEC VAXstation and software.

Vitalink currently offers software that uses the Simple Network Management Protocol, an emerging standard for management of Transmission Control Protocol/Internet Protocol networks, to monitor and control Vitalink bridges.

StrataCom is working with Vitalink to develop software that will enable WAN Manager to support a StrataCom proprietary network management protocol used to manage its T-1 multiplexers. That software is expected to ship early next year.

StrataCom said it will continue to sell its proprietary StrataView network management system, which consists of an IBM Personal Computer and proprietary software, in addition to jointly marketing the WAN Manager product with Vitalink and building a link to EMA. Vitalink will continue to sell WAN Manager configured to manage Vitalink networks while also building a separate product to link its bridges to EMA.

Both Lee-Thorp and Brian Button, StrataCom's product manager for network management and data communications, said this strategy will enable customers to purchase a proprietary management tool to manage networks that have either StrataCom's or Vitalink's devices.

— Jim Brown

IBM set to ship NetCenter

continued from page 2

briefing, IBM said it will ship an internally developed graphic NetView interface by the end of 1990, prompting consultants to term NetCenter merely a stopgap measure to fill a glaring need ("IBM reveals NetView graphic interface plan," *NW,* Oct. 16).

The internally developed interface is expected to feature an LU 6.2 link to the mainframe and will be based on OS/2 and IBM's Presentation Manager, which fits with the Common User Access (CUA) standard within IBM's Systems Application Architecture.

By contrast, NetCenter is based on DOS and uses the GEM graphics software from Digital Research, Inc. It links to the mainframe via a 3270-type LU 2 connection, which is slower and less functional than an LU 6.2 link, according to analysts.

"They've basically divulged that they're going to come out with a better product within a year that's going to run under OS/2," said Dean Wolf, a manager at Network Strategies, a network consulting practice of Ernst & Young in Fairfax, Va. "Unless the price differential is enormous, what's the point [in buying NetCenter]?"

Onetime charges for host-based NetCenter software range from $43,400 to $71,400, depending on the System/370 processor type. Monthly license fees range from $1,085 to $1,785; workstation software costs extra.

Mark Knittel, IBM's systems manager for network management, declined to confirm whether IBM will ship an internally developed graphical interface to NetView next year and said such reports were speculation.

But a NetView user from a large company who asked not to be identified said IBM has told him an internally developed graphical interface would debut next year.

The same user was dismayed at the price tag of the NetCenter products because, when the cost of workstation software is included, the product can cost more than NetView, at least for MVS/XA systems.

Under MVS/XA, NetView pricing ranges from $41,400 to $103,650, while its cost ranges from $56,110 to $126,500 under MVS/ESA.

IBM said investments in NetCenter will be protected.

"The customer can be comfortable with the fact that we will protect them both price-wise and migration-wise with any kind of enhancements that we do come out with in the future," said Helen Morse, IBM's manager of network management software marketing.

Morse said that protection would apply even if the "enhancements" were a completely new product not based on NetCenter. Customers concerned about protecting their investment can elect the monthly licensing charge, she said.

NetCenter's center

IBM also disclosed additional details about features that will ship with NetCenter.

The core NetCenter component is the Graphic Network Monitor (GNM), which consists of both host- and microcomputer-based software. The host-based software collects event and alarm data from VTAM or, if installed, from NetView. It forwards that data to a DOS-based microcomputer running a separate GNM software component that displays the alarms graphically.

SPI runs on the mainframe and collects data on non-SNA devices that are unknown to VTAM. It requires the use of a service point such as NetView/PC to collect net management data from non-IBM devices and convert it to a NetView-compatible format.

An optional Inventory Information Manager (IIM) software module lets users set up a host-based data base of information about both SNA and non-SNA resources that can be easily accessed from the NetCenter console. It can include information such as component descriptions, locations and site contacts.

NetCenter also obviates the need for console operators to have extensive knowledge of VTAM and NetView commands since it provides menus that present generic descriptions of network tasks and functions. By clicking on both an icon and a command, the console operator can conduct such tests without using formal VTAM or NetView command structures.

Three GNM workstation software packages will be available. Manager Workstation software costs $1,000 and supports only passive monitoring, while the $2,000 Operator Workstation package lets users control networked devices.

At least one $5,000 Administrative Workstation software package is required to define users and work groups, set alarm filter priorities and build customized network views.

NetCenter is available only for MVS environments; Knittel said IBM has no plans at this time to offer a version of the product to run under VM.

DEC unwraps EMA product

continued from page 2

year end. The announcements also help DEC appease EMA critics, who have chastised the company for lagging behind IBM and AT&T in releasing integrated net management products.

"There is a lot of the infrastructure now in place to support EMA," said Howard Niden, senior manager in the management consulting services department of Price Waterhouse's Pittsburgh office. "If I were a developer who wanted to build EMA applications, I'd be delighted at this point."

The hardware core

The DECmcc Management Station, announced last week and due out in January, will help DEC keep pace with IBM and AT&T, both of which offer workstations that support many of the same functions.

As expected, the DECmcc Management Station is based on a VAXstation 3100 running VMS and supporting DECwindows ("DEC preps for EMA, All-In-1 product blitz," *NW,* Oct. 9). The device will enable users to integrate existing net management applications, which are run on VAXes today, on a single workstation and control a variety of devices such as bridges and routers.

The DECmcc Management Station will come in two versions: a DECmcc Site Management Station designed to monitor and control DECnet LANs, and a DECmcc Enterprise Management Station for monitoring and controlling DECnet wide-area networks (WAN). Both versions have an Ethernet interface.

Imagine the possibilities

The DECmcc Site Management Station will run the following existing DEC management applications: the Network Management Control Center (NMCC)/VAX Ethernet Integrity Monitor, which enables managers to monitor devices attached to Ethernets; LAN Traffic Monitor, which collects Ethernet usage statistics and displays that data in a graphical format; Terminal Server Manager, which monitors and controls DECnet-attached terminal servers; and Remote Bridge Management Software, which lets managers monitor and control DECnet-attached LANbridge 100 bridges.

In addition to these applications, the DECmcc Enterprise Management Station will run DEC's NMCC/DECnet Monitor, which enables users to monitor DECnet WAN routers and links between those routers for such information as the number of data packets received with errors.

The DECmcc Management Station will run DECmcc Director software when it is released, enabling users to control multivendor networks from a single workstation.

DECmcc Director — the core software component of EMA — manages the flow of data between EMA Access Modules, Functional Modules and Presentation Modules. These modules, described in an EMA blueprint released last fall, run on the same workstation as DECmcc Director.

The modules will use International Standards Organization-based net management standards, such as the Common Management Information Protocol and ASN.1 data format, to collect and merge data from disparate devices onto a single screen.

Access Modules, which are being developed by DEC and its EMA partners, will collect net management data and forward it to one or more Functional Modules.

Functional Modules store data in a data base and allow users to retrieve information to prepare performance reports. They are also used to flash alarm messages on the workstation screen when alarms are received.

DECmcc Management Station

DEC's Presentation Modules define the DECwindows-based graphical user interface and spell out how topological network maps can be created.

Of the initial seven EMA partners — Codex Corp., Digital Communications Associates, Inc., Siemens AG, StrataCom, Inc., Timeplex, Inc., TSB International, Inc. and Vitalink Communications Corp. — only Codex, StrataCom, TSB and Vitalink said they will ship Access Modules when DECmcc Director ships.

The six new EMA partners — ChipCom Corp., Infonet, Newbridge, Nynex Information Solutions Group, Inc., TelWatch, Inc. and 3Com — said they are only now beginning to develop Access Modules.

The DECmcc Management Station costs $20,400. Customers that currently use DEC's management packages can trade in those programs for versions that will run on the new management console.

Users that purchase the workstation now will receive DECmcc Director software free of charge when it is available.

According to David Korf, DEC's director of network management marketing, "This gets users to think about managing on a workstation today, which is really the way to do network management."

LAN mergers result in pluses

continued from page 2

ing new products, observers said.

"The 3Com/Bridge deal has been particularly disappointing since I had such high hopes for it," said Brad Baldwin, an industry analyst at Dataquest, Inc., a San Jose, Calif.-based market research firm. "Bridge provided host connectivity and 3Com provided PC LAN connectivity. It looked like a perfect fit."

Recent acquisitions

Company	Acquired	Date
Sun Microsystems, Inc.	Centram Systems West, Inc. (including TOPS product line)	April 1987
Digital Communications Associates, Inc.	10NET Communications	Aug. 1987
3Com Corp.	Bridge Communications	Sept. 1987
Tandem Computers, Inc.	Ungermann-Bass, Inc.	June 1988
Hughes Aircraft Co.	Sytek, Inc.	April 1989
Racal Corp.	InterLan, Inc.	May 1989
Novell, Inc.	Excelan, Inc.	June 1989

GRAPHIC BY SUSAN J. CHAMPENY

Bridge was a high-flying internetworking and net management firm when it was acquired, but it has since lost many of its top executives and has contributed few innovative new products, analysts said.

3Com also had trouble managing Bridge's direct sales force and its own reseller distribution channel, they said.

Eric Benhamou, vice-president and general manager for 3Com's distributed systems division and a founder of Bridge, admitted that 3Com made mistakes after acquiring Bridge, but he claimed things are turning around. It typically takes 18 months to get a product out the door, so 3Com is not as far behind as some observers think, he said.

For example, 3Com last week started shipping a new 3+Open Transmission Control Protocol/Internet Protocol product that was the direct result of development work between 3Com and its Bridge business, Benhamou said.

While joint product development is the ideal result of an acquisition, joint marketing strategies can be just as beneficial to users, said Paul Deninger, a senior associate with Broadview Associates, a Fort Lee, N.J.-based investment banking firm.

Tandem Computers, Inc.'s acquisition of Ungermann-Bass, Inc. is a good example of companies that have worked well together, Deninger said. "It gives those companies the opportunity to act as systems integrators," he said. "The UB products give users of Tandem systems the chance to talk to disparate systems."

Tandem last month introduced its NonStop Cyclone mainframe computer, which supports Ungermann-Bass' Access/One LAN products. Until Ungermann-Bass rolled out a spate of new offerings last month, some observers were concerned that the LAN maker's product development activities were drying up.

Too soon

The jury is still out on more recent LAN industry acquisitions, such as the Novell/Excelan and Hughes Aircraft Co./Sytek, Inc. deals, but analysts are optimistic about both of those agreements.

Excelan gives Novell the TCP/IP products it was lacking, although it puts Novell back into the hardware business just as it was finishing its migration toward being a software-only firm.

The Sytek agreement is seen as beneficial for Sytek (now Hughes LAN Systems) users since the company was in dire financial straits before the acquisition.

Bill Hipp, director of marketing at Hughes LAN Systems, said some cooperative selling has begun between his unit and its parent. Hughes also is working with its new LAN arm to develop net management and LAN-to-wide-area network offerings that will support products from both businesses, he said.

The trend toward consolidation in the LAN industry is expected to continue, Deninger said. Although the pool of attractive LAN takeover targets is shrinking, vendors with niche LAN technologies will make good buys, he said. "Novell keeps upping the ante in this business with its dramatic growth, so you've got to be a certain size to play," he added.

Bear, Stearns' Giglio agreed. "In a fast-growing field like networking, a small company can run out of money quickly doing marketing and R&D, and building a sales force. That's why you'll continue to see them looking for partners."

Vendors wage PC bus war

continued from page 1

mac as the two debated the relative merits of the MCA and EISA buses. Win, lose or draw, one thing is clear: Both the MCA- and EISA-based superservers can put most minicomputers to shame.

"It's probably going to be the last nail in the coffin for minicomputers," said New York-based analyst Esther Dyson of the superserver phenomenon. Dyson is president of EDventure Holdings, Inc.

The combination of 80486 microprocessors with buses that have the bandwidth and sophisticated traffic management capabilities of MCA or EISA produces a system that is overkill for most desktops but ideal for local-area network servers.

Multiple bus master boards can be used to create a "LAN-in-a-box," using the bus as a high-speed network. For example, a disk drive could talk directly to a printer without involving the system processor.

While most of the three million MCA systems installed to date are based on 16-bit 80286 or 80386SX processors, the EISA architecture — which is 32-bit by definition — seems to be geared toward the file server niche.

"Now that the EISA machines and cards are starting to appear, [the only products we see are] high-performance systems, disk controllers and network adapters that are aimed at the file server environment," said Mike Howard, vice-president of Infonetics, Inc., a market research firm in Santa Clara, Calif.

More than 20 32-bit bus master EISA adapters have already been introduced for the EISA machines. By contrast, fewer than 30 of the 1,150 MCA adapters that have appeared over the past two years are 32-bit bus masters.

The manufacturers of EISA adapters are being aided by an EISA bus master chip from Intel Corp. Intel is developing a similar chip for MCA bus masters, but it won't be available until some time next year.

The MCA and EISA factions are not just battling each other; they are also being challenged by a new category of dedicated file servers whose designers abandoned standard personal architectures in their quest for greater performance and reliability.

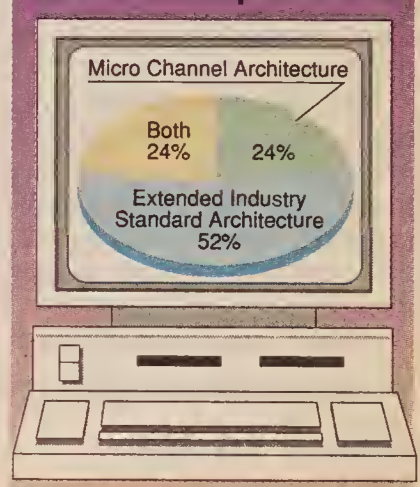
The most visible is NetFrame Systems Corp.'s NetFrame, which runs Novell, Inc.'s NetWare 386 and Microsoft Corp.'s LAN Manager 2.0, and also has ports for connecting standard SCSI devices. However, it does not support industry-standard expansion cards; network interfaces and other add-on boards must be purchased from NetFrame.

"These souped-up PCs [such as the Compaq SystemPro] can't do this type of thing," said Jeff Hudson, vice-president of sales for NetFrame Systems. "Our mean time between crashes will be lower."

Of course, the MCA, EISA and NetFrame factions all say their systems are the fastest and offer the best price/performance.

"I sure want to see an objective shoot-out between these different servers," said Howard. "They represent three powerful competing technologies." And they cost only a fraction of what the minicomputers they are trying to supplant cost.

Users' PC bus preferences



Figures are based on a survey of 208 *Network World* readers who were asked to identify the bus standard they would be most likely to support.

GRAPHIC BY SUSAN J. CHAMPENY

PCs positioned as servers

continued from page 4

limiting," Leppanen said.

The Premium 486/25TE tower comes with 2M bytes of standard memory, expandable to 36M bytes. The microcomputer-based server supports up to six 5¼-in. disk drives for a total of 2G bytes of internal hard drive storage.

It contains 10 expansion slots that support eight-, 16- and 32-bit expansion boards and as many as six EISA bus master boards.

The Premium 486/25TE EISA tower comes in four models: the Model 5 costs $10,245; the Model 115, with a 110M-byte AT-embedded hard drive, costs $11,745; the Model 665, with a 660M-byte Small Computer System Interface (SCSI) hard drive, costs $15,745; and the Model 1005, with a 1G-byte SCSI hard drive, costs $19,245.

The Premium 486/25E desktop, by contrast, comes with 2M bytes of standard memory, expandable to 36M bytes, and has five disk drives that offer a total of 320M bytes of memory.

In addition to high-resolution graphics, the company said the Premium 486/25E desktop is well-suited for use in data-intensive LANs.

Another difference between the EISA desktop and tower models is that the floor-standing tower has three more expansion slots, an extra disk drive and up to 1G bytes more storage memory for data base and high-resolution graphics applications.

The Premium 486/25E desktop is available in three models: the Model 5 costs $9,745; the Model 115, with a 110M-byte AT-embedded hard drive, costs $11,245; and the Model 325, with a 320M-byte Enhanced System Disk Interface drive, costs $13,395.

The EISA systems will be available in the first quarter of 1990.

Both support any LAN operating system that runs on Intel Corp.'s 80486 platform, including Novell, Inc.'s NetWare 386, 3Com Corp.'s 3+Open, Microsoft Corp.'s LAN Manager and Unix, Leppanen said.

AST Research will not initially offer EISA LAN interface cards for the systems, though it could possibly do so in the future, Leppanen said.

ISA model added

AST Research also unveiled the Premium 486/25T ISA floor-standing computer, which is intended for use as a network server. The company said the Premium 486/25T offers performance required by CPU-intensive applications, such as computer-aided design and manufacturing.

The Premium 486/25T offers 2M bytes of standard memory, expandable to 36M bytes. It supports a maximum of 1G bytes of storage and has 10 expansion slots that support existing eight- and 16-bit cards.

It comes in four models: the Model 5 is priced at $8,995; the Model 115, with a 110M-byte AT-embedded drive, costs $10,495; the Model 665, with a 660M-byte SCSI hard drive, costs $14,495; and the Model 1005, with a 1G-byte SCSI hard drive, costs $17,995.

The Premium 486/25T is also expected to be available in the first quarter of 1990.

Telecom pack gets net upgrade

continued from page 6

lines, through its error-checking and error-correction techniques.

High transfer rates are achieved mainly because data compression takes place at the personal computer, rather than at the modem, according to Gray. Transmission bottlenecks typically occur at the modem, even with modems using V.42bis data compression, which compresses at a 4-to-1 ratio, or Microcom, Inc.'s Microcom Network Protocol, Gray said.

The software is compatible with more than 50 modems, including those supporting all major standards such as V.22bis, V.32 and V.42 protocols. HyperAccess/5 also supports ASCII and Bull Worldwide Information Systems, Inc.'s Kermit protocols.

"This allows us to achieve compatibility with a broad spectrum of remote computers," Gray said.

The software's artificial intelligence-like capabilities can learn commonly performed routines and play them back.

The artificial intelligence-like abilities of the product can be employed for more sophisticated command sequences as well. For example, the software can automatically dial into MCI Communications Corp.'s MCI Mail and retrieve messages at user-specified times.

The OS/2 version of HyperAccess/5 requires OS/2 Version 1.0 or later. HyperAccess/5 is available now for $199; HyperAccess users can upgrade to it for $55.

IBM, Microsoft plot LAN plan

continued from page 1

ed Edition — the Data Manager and Communications Manager — available to OS/2 users that have non-IBM hardware. This will enable users to run Systems Application Architecture (SAA) applications, such as IBM's Office Vision, across multivendor personal computer networks.

Besides agreeing to rectify product differences, IBM and Microsoft have promised to collaborate on the development of a new version of OS/2 that will require less workstation memory.

They have also pledged to deliver by the end of 1990 a 32-bit version of OS/2 for machines based on Intel Corp. 80386 and 80486 processors. This is the long-awaited version that will be able to run multiple DOS applications concurrently, thereby enhancing the appeal of OS/2.

Last Monday's announcement ended speculation that the 9-year-old joint development agreement between Microsoft and IBM was in trouble. There have been rumors, hotly contested by Microsoft, that IBM had decided to go a separate systems software route.

"We've been partners for a long time but not always with the greatest consistency," said James Cannavino, vice-president and general manager of IBM's Personal Systems Division. "It was time to make some changes."

The announcement was a victory for Microsoft's network business, which has been struggling to give LAN Manager a toehold in a market dominated by Novell, Inc. (see "LAN Manager specter rises before Novell," page 27).

"What this demonstrates more than anything else is [Microsoft Chairman] Bill Gates' clout with IBM," said Nick Arnett, an analyst with market research firm Creative Strategies, Inc. in San Jose, Calif. "Microsoft is going to have a lot of influence over the direction IBM takes."

This influence was not so evident 18 months ago at Comdex/Spring in Atlanta. There, an IBM official publicly contradicted statements by a Microsoft representative that the then-unreleased LAN Manager and LAN Server would be interoperable.

Since then, the two products have been steadily converging. Both incorporate the same Named Pipes interprocess communications facility and with the release of LAN Server 1.2 early next year, at least 85% of the Application Programming Interfaces (API) in LAN Manager and LAN Server will be the same.

The remaining differences are in the area of security and network administration, so server-based applications that don't make use of APIs in those two areas will run, unmodified, in LAN Manager and LAN Server environments.

The goal is to have both operating systems support all of the same APIs so developers can use any interface without worrying about interoperability.

"To be an industry leader, you have to be part of the industry," said Cannavino, when asked why IBM was dropping its proprietary approach to microcomputer system software. IBM would like to lead the industry away from DOS and toward OS/2, he added.

While OS/2-based servers can support DOS clients, the full power of OS/2 networking is realized only when OS/2 is running on both the server and the end user's workstation, the client. One of the obstacles to the adoption of OS/2 on client workstations has been the price of its memory requirements, at least 3M bytes of random-access memory.

To help alleviate this problem, Microsoft and IBM plan to deliver a version of OS/2 by the end of this year that can swap out the DOS compatibility box so OS/2 applications can use its 512K bytes of memory. This reduces the minimum required memory for OS/2 to 2.5M bytes, and the two companies are trying to further reduce it to 2M bytes.

Another obstacle to OS/2 acceptance is the growing popularity of Microsoft Windows. Microsoft Windows looks just like OS/2's Presentation Manager and gives the single-tasking DOS the appearance of a multitasking environment, such as OS/2.

Since Microsoft sells both the DOS/Windows and Presentation Manager environments, it wins regardless of which one users choose. However, several years ago, IBM designated Presentation Manager as its strategic front end for applications in its SAA.

Consequently, IBM has made concessions to the continued popularity of DOS only grudgingly, and it clearly views Microsoft Windows as an alternative that is impeding the spread of OS/2.

The new agreement requires Microsoft to bring any new applications out under Presentation Manager first, and release Microsoft Windows versions for DOS at later dates. Microsoft also had to stipulate that it will curtail future Microsoft Windows development.

Specifically, Microsoft cannot release a 32-bit version of Microsoft Windows or add advanced OS/2 abilities, such as distributed processing or long file names.

IBM unveils enhanced LAN Server and OS/2 EE

LAS VEGAS — IBM announced at Comdex/Fall '89 here last week new versions of its LAN Server software and underlying OS/2 Extended Edition operating system that offer local-area network users increased performance and functionality, as well as less expensive configuration alternatives.

LAN Server Version 1.2, based on Microsoft Corp.'s LAN Manager, includes built-in Ethernet support that extends the potential use of LAN Server beyond IBM's traditional Token-Ring environment. It runs on Version 1.2 of OS/2 Extended Edition, which has been enhanced to support IBM's LU 0.

Under Version 1.2 of LAN Server, the Data Manager component of OS/2 Extended Edition is no longer just a stand-alone data base for individual workstations. It can be configured as a data base server that can handle network requests from front-end DOS or OS/2 applications running on clients.

Also, security can be set up to span all LAN Server and Extended Edition facilities, so a single user identification and password can give access to all network resources.

The new LAN Server version includes a DOS LAN Requester that can be copied up to 128 times.

Under LAN Server 1.0 (there is no 1.1 version), each DOS client had to run IBM's PC LAN Program plus a LAN Support Program that links the PC LAN Program to LAN Server. The total price users had to pay was $205 per DOS workstation, a cost that has been eliminated under LAN Server 1.2.

The new DOS LAN Requester includes Microsoft's Named Pipes interprocess communications facility; it can be partially loaded into high memory to increase the space available for running applications.

IBM also announced its intention to increase user options for supporting OS/2 clients on a LAN Server network. Under the existing 1.0 version and forthcoming 1.2 version, all OS/2 clients must be equipped with the full OS/2 Extended Edition operating system, including its Communications Manager and Data Manager. This makes adding OS/2 clients to a LAN Server net an expensive proposition.

LAN Server could be tied to its OS/2 base in exactly the same manner as Microsoft's LAN Manager. The Extended Edition component — the Communications Manager and the Data Manager — would be available as options to workstations or servers that needed such functionality.

LAN Server 1.2 and OS/2 Extended Edition 1.2 are scheduled for release March 30. LAN Server 1.2 is priced at $1,040 per server, and users of LAN Server 1.0 can obtain a free upgrade until the end of June.

— *Susan Breidenbach*

AT&T to up PRI access

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of ISDN Primary Rate Interface network entry points in 1990 and welcomed the cost revisions.

"AT&T has exceeded its original ISDN deployment timetables and has become increasingly aggressive in marketing and pricing ISDN PRI," said William Rahe, president of The Aries Group, Inc., a Rockville, Md.-based consulting company.

The carrier has already equipped 4ESS switches in 73 cities to support ISDN and will upgrade 37 more next year.

AT&T will enable users to access Primary Rate Interface-equipped switches from an additional 180 points of presence (POP) across the country by using digital access and cross-connect systems to pass traffic to nearby ISDN-compatible 4ESS switches.

This brings the total number of ISDN Primary Rate Interface access points to 290 by the end of 1990.

"Almost all our PRI users [wanted us] to provide the service from the same locations we use to provide 800, Megacom and SDN service," said John Kauza, ISDN and Signaling System 7 manager for AT&T.

One analyst said competitive pressure figured in AT&T's decision to accelerate the Primary Rate Interface rollout.

"The decision is, in large measure, a competitive response to US Sprint's plan to offer PRI through 268 POPs in the first quarter of 1990," according to Ian Angus, president of Angus TeleManagement Group, Inc., a Pickering, Ontario-based consulting company.

Although US Sprint's services will be offered through all its POPs, the carrier will only be supporting them from two ISDN-compatible central office switches. In contrast, AT&T will support the Primary Rate Interface from central office switches in 110 cities ("Stage is set for an ISDN showdown," *NW,* Sept. 18).

American Express Travel Related Services Co. (TRS) — AT&T's first commercial ISDN user — and First Data Resources, Inc., an Omaha, Neb.-based data processing service bureau, pressed the carrier to offer Primary Rate Interface through more POPs, according to Kauza.

Robert Hoss, planning and engineering vice-president for TRS' worldwide telecommunications group, said, "Anything that reduces PRI access costs makes the service more viable and is a definite advantage for our company."

Many TRS ISDN sites already use direct fiber links to reach Primary Rate Interface-ready AT&T 4ESS network switches, according to Hoss, who would not say how much his firm spends on Primary Rate Interface access. Any reduction in access costs would encourage the company to consider expanding its use of the service, he said.

News of the ANI price reductions was treated with equal enthusiasm.

Originally designed for telemarketing service bureaus and companies with customer service, order entry and reservation applications, ANI delivers the telephone number of a caller to the called party. AT&T currently charges users 3 cents per ANI, a sum users said was too high.

"We told AT&T that the 3 cents per ANI was unpalatable when they were putting the service together a few years ago, but they didn't listen to us at the time," Hoss recalled. Under the new pricing plan, the price per ANI drops to 2 cents and to 1 cent for each call over the 60,000-call-per-month level.

TRS said the reductions could spur use of ISDN in applications involving short calls. "With shorter calls, the 3 cents per ANI is a big part of the overall bill. Reducing the cost of ANI would [enable companies to use] ISDN for applications such as credit card authorization," Hoss explained.

While ANI is currently used by about 20 U.S. companies, with another 200 in queue, Call-By-Call Service Selection is only used by six customers, including CSX Corp. and Comdisco Disaster Recovery Services, Inc., according to AT&T's Kauza.

The carrier has now proposed offering Call-by-Call Service Selection as a standard feature with ISDN Primary Rate Interface. AT&T plans to eliminate the $250 onetime establishment charge and the $200 rearrangement charge, and add SDN to the pool of services supported by the feature.

Call-by-Call Service Selection enables customers to use a single Primary Rate Interface link to access multiple switched services from an AT&T POP. Customers can then use any of the 23 64K bit/sec DS0 bearer channels on the T-1 link to support any service.

Before Call-by-Call Service Selection, users had to assign T-1 channels to specific services. Now, users can rearrange the channels to support different services as their needs change.

The feature was first available to Megacom, Megacom 800 and Accunet Switched Digital Service subscribers.

"I'm surprised the take rate on [Call-by-Call Service Selection] isn't better," Kauza said, adding that the feature is most attractive to companies that use several services at their main location.

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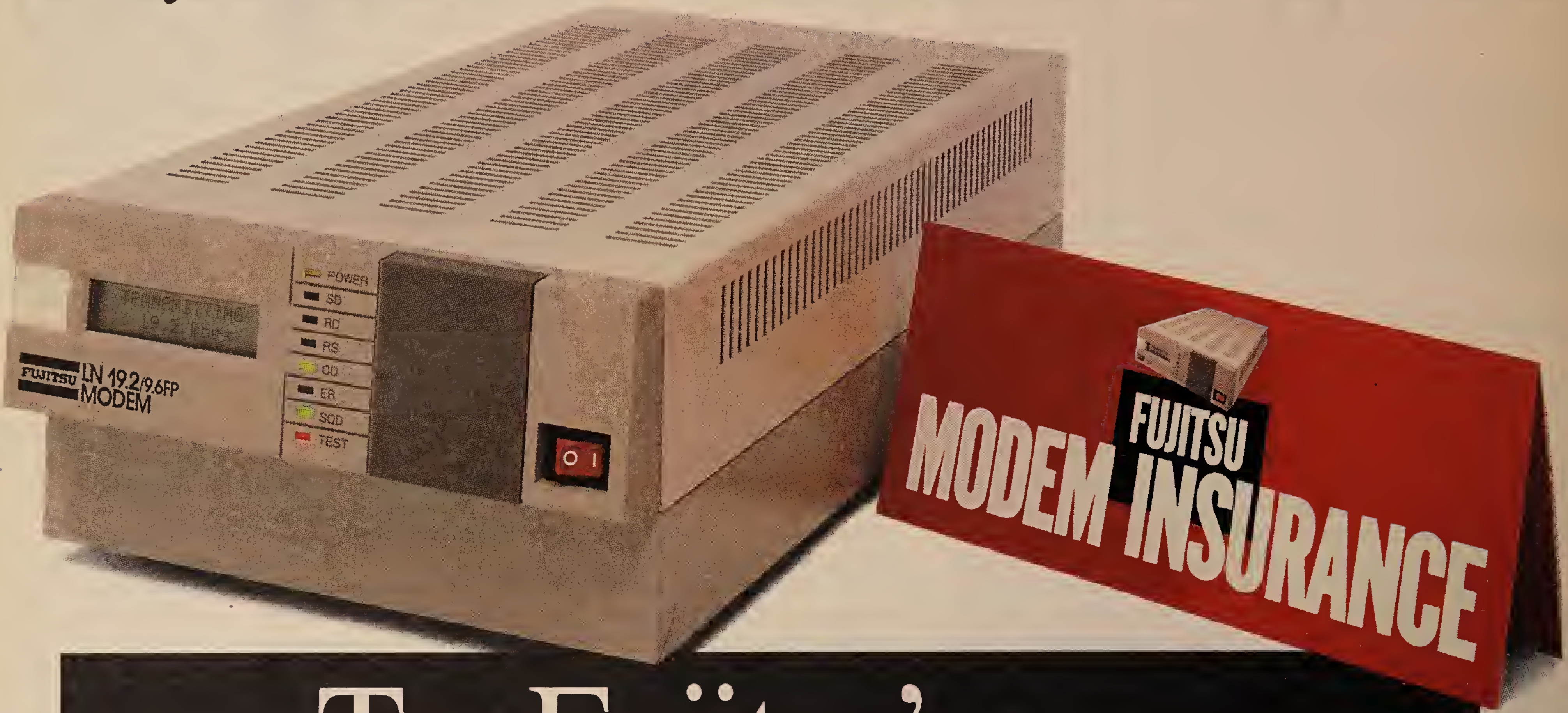

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